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THE VALIDITY OF THE TELIC DOMINANCE SCALE

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ABSTRACT

The Telic Dominance Scale (TDS) is a 42 item pencil and paper psychometric instrument intended to measure the extent to which a person is seriousminded, planning orientated, arousal avoiding and telic or paratelic dominant.

Using test related reliability methods, this study demonstrates that the TDS is a reliable instrument over a variety of time intervals up to one year.

Reviewing a variety of studies, including a number in which the author was the sole or a collaborative researcher, it is suggested that the TDS is a valid instrument in the sense in which 'validity' is used in the psychometric tradition. Some doubts concerning the phenomenological grounding of the TDS are examined in the context of a multi-method validation study.

Using a principal components analysis with varimax rotation, a factor analysis of TDS responses suggests that the factor structure of responses does not match the structure implied in the sub-scale structure in the TDS. The implications of this finding are fully discussed.

Stephen Murgatroyd
Cardiff, November 1983.

NOTICE

The material in this thesis, unless otherwise stated, is the work of the candidate. Certain parts of this thesis appeared in the Journal of Personality Assessment in 1978 (see Appendix 5) in a paper for which the candidate was the principal author. Where the work of others is cited (especially in Chapter Six), full permission has been given to do so.

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HD24(iii), HD25 and HD28.

Stephen John Murgatroyd
Cardiff, November 1983.

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Stephen Murgatroyd
Cardiff, November 1983

PREFACE

Since beginning work on this project in 1976, it has been gratifying to see both the rapid development and acceptance of reversal theory and the more particular development of the Telic Dominance Scale (TDS).

Indeed, at a recent International Symposium on Reversal Theory sponsored by the Welsh Branch of the British Psychological Society and the British Council, several papers were presented which examined the utility of the TDS in the study of coronary prone behaviour and coronary heart disease (CHD), in the study of coping in relation to stress and in the study of the basic structure of personality.

Not only are there attempts to apply the TDS to such areas as mentioned here, but also the scale is now being used in France, USA, Canada, Norway, Sweden, Spain, Belgium, Britain and Romania. Papers reporting its utility have appeared in Motivation and Emotion, Journal of Personality and Social Psychology, Journal of Personality Assessment, Psychophysiology, British Journal of Clinical Psychology, Scandinavian Journal of Psychology, British Journal of Guidance and Counselling and several other journals. The scale has been widely reproduced, especially in Apter (1982), Apter and Rushton (1981) and Aero and Werner (1981) and some 30 studies are known to be in progress at this time.

This thesis examines the available data relating to the validity of the TDS as available up to June 1983. It was not possible to include some of the data made available subsequently (especially that by Rod Martin of the University of Waterloo, Canada and Michael Cowles and Caroline Davis of York University, Ontario, Canada) in this study.

The aim here is restricted. It is to examine issues of validity in relation to the TDS. Some of the applications of the TDS - especially those relating to stress - are not included here. There will always be other opportunities to examine these and other concerns.

Stephen Murgatroyd,
Cardiff, November 1983.

CHAPTER ONE

TELIC AND PARATELIC DOMINANCE AND THE THEORY OF PSYCHOLOGICAL REVERSALS

Introduction

A system, such as a thermostatic heating system or a steam engine or a self-steering missile, which is able to regulate itself in such a way as to maintain certain of its variables (and hence its performance) within certain desired limits is referred to as a self-regulatory or homeostatic system. (Apter, 1970; Beer, 1959; von Bertalanffy, 1968). Others, such as Hall (1962), describe such systems as 'stable systems'. Hall offers the following description of such a system :

'A system is stable with respect to certain of its variables if these variables tend to remain within defined limits. The man-made thermostat is an example of a device to ensure stability in the temperature of a heating system..... An adaptive system maintains stability for all those variables which must, for favourable operation, remain within limits.'

(p. 70)

The term homeostasis was first used extensively in a systems context by Canon (1932) to describe the self regulatory actions of physiological systems in controlling blood temperature levels.

Since its extensive use in cybernetics, as documented by von Bertalanffy (1968), homeostasis has come to be used as a descriptor of a variety of systems which are psychological in nature. For example, Izard and Tomkins (1966) suggest that individuals, when faced with a crisis situation may act in such a way as to seek to restore their former psychological equilibrium :

'A crisis situation.....may place the organism in a state of alarm and bring about a high degree of organismic arousal. Until homeostasis is regained, the individual may be dominated by the dysfunction.'

Similar uses of this construct are made by Caplan (1964) and Brandon (1970). Menninger et al (1963) is also able to describe the progress of mental

disease in terms of the settling down at ever lowering homeostatic levels until preserving the physiological system is all that is left. Arieti's (1959) explanation of schizophrenia in terms of 'progressive teleological regression' makes similar uses of the homeostatic concepts.

Psychopathology is not the only area of psychology to utilise the homeostatic concept. It has been used in psycho-biology (Pribram, 1964), in the study of arousal and motivation (Hull, 1943) and in cognitive psychology (Mowrer 1960). Whilst some such uses are clearly inappropriate (von Bertalanffy, 1968 esp. at p. 212), the concept has found wide acceptance as a description of many psychological systems.

Indeed, so widely accepted is the concept of homeostasis within psychology that many psychologists have come to believe that homeostasis is a term that can be used to explain a great many psychological processes, most especially those associated with drive and motives (Mowrer, 1966; Hull, 1943; Buhler, 1960).

The analysis of a variety of motivated acts and psychological processes in terms of homeostatic models has been subject to critical scrutiny. Frankl (1969), Maslow (1954, 1970) and Charlotte Buhler (1959, 1964) all suggest that the pursuit of homeostasis, rather than being a characteristic of the 'normal' organism, is a sign of disorder. Gordon Allport (1960) also rejects a model of the person as 'homeostatic driven' on the grounds that such a model "falls short of representing the nature of propiarte striving" whose "characteristic feature is resistance to equilibrium : tension is maintained rather than reduced." Harlow (1953) suggests that homeostatic models fail to explain why individuals are motivated to engage in exploration, curiosity and play. Others point to experimental studies

such as those of Flynn, McCleon and Kim (1961), which show that rapid changes in performance on a perceptual motor task can only be explained by a model which is non-homeostatic in nature. Murray (1962) also suggests that the complex relationship between drive and reward cannot adequately be explained by reference to homeostasis. Some other system is needed if the complexity of such relationships is to be understood.

Homeostatic systems are not, however, the only systems to be identified within cybernetics. Another 'set' of systems are those which display multistability. That is, systems which have many operational states for the achievement of systems objectives. A particular type of multi-stable system is a bi-stable system in which there are two operational states between which the system will 'choose' or find itself operating at any given moment in time, depending upon the systems objective at that time.

The theory of psychological reversals, developed by KCP Smith and Michael Apter (1975), is a theory of human action which began from a rejection of homeostatic interpretations of motivation and from the development of bi-stable models of motivation in relation to certain meta-motivational psychological modes.

Meta-Motivational Modes in Reversal Theory

The term 'state' in psychology is used as a term to describe a person at a moment in time: it is the mode of existence for a particular person at a particular moment in time. Brown (1976) suggests that there are over 40,000 descriptions of states that can be used when an attempt is made to describe the psychological state a person is experiencing at a given moment

in time. Such descriptions can include 'anger', 'fearful', 'bored', 'playful', 'serious', 'sensation-seeking', and many others. Dealing with up to 40,000 adjectives or phrases to describe psychological states is clearly impractical: few would agree on the exact meaning of terms, the precise conditions for ascribing one term rather than another to a particular person at a particular moment in time would be difficult to ascertain and it would be difficult to provide an efficient, reliable and valid procedure for the recognition of such states by a variety of individuals. So as to reduce the number of descriptive terms, psychologists have developed a repertoire of traits - clusters of inter-related states or behaviours - which act to provide descriptions of a person both at a moment in time and generally (Anastasi, 1948, 1970).

To be useful as descriptors, traits 'must be relatively stable over time and in different situations' (Brown, op.cit.). That is, the trait description of a person is intended to be used as a general description of that person in a variety of situations. For example, we may wish to describe X as being generally 'sensation-seeking' in the sense in which Zuckerman (1974) uses this term to describe a particular trait. Knowing that X is generally disposed to sensation-seeking as a motive for his behaviour enables us to make predictions about X's behaviour. But there are times when X's behaviour will not be sensation-seeking and times when, though we might predict otherwise, X does not behave in a way that might be anticipated from an understanding of this complex trait. These apparent discrepancies occur for two reasons. First, traits are abstractions developed by psychologists to make easier the description of human action. In this sense there are abstractions which permit the general description of a person's predispositions. Second, knowing that X generally behaves in a way commensurate with our knowledge of his predispositions does not imply that he will always do so:

there is an interaction between X and his environment which brings out other states not part of the traits we have come to associate with X. In short, traits are simply reductionist generalisations about a person on the basis of which it is hoped to predict a person's behaviour with some reliability.

Reversal theory proposes that there is a complex relationship between mental states and behaviour. 'It does not assume that there is a simple one-to-one correspondence between given mental states and given pieces of behaviour, such that for a given individual the same behaviour is always accompanied by the same significant mental states; or, between individuals, that similar behaviour is associated with similar significant mental states' (Apter, 1982, p.5). Indeed, grossly similar behaviour may be associated with contrasting mental states. Apter (1979) gives the example of a person riding a bicycle in order to get to a particular place :

'The behaviour is the cycling, the goal is arrival at the place in question. Now there are two different ways in which the subject may interpret the combination of his goal and his behaviour. In one case the goal may be felt to have priority and the behaviour be chosen in order to achieve his goal. Thus the individual may have to get to the place concerned because he works there: he therefore has no choice over the goal, he feels it is essential that he achieves it, and everything is directed towards this end. He may however, vary his behaviour in getting there. In the other case, the behaviour may have priority and the goal be simply an excuse for the expression of the behaviour. Thus the individual may enjoy cycling and the focus of his attention be on the cycling itself for its attendant pleasures.'

(p.49 - 50)

- suggesting that grossly similar behaviour (cycling) may be associated with contrasting motivational states (goal-achievement and behavioural satisfaction). The point to note is that the same person could perform the same behaviour on different occasions with different motives. This Apter refers to as the principle of inconsistency.

Such a view of inconsistency helps us understand commonly observed features

of behaviour, namely paradoxical (or self-damaging) behaviour and biologically gratuitous behaviour (such as art, religion, humour). For, in reversal theory terms, such behaviours need to be understood not in terms of the goal they satisfy but in terms of the gratifications they afford the person performing such behaviours.

This observation leads in turn to a major proposition in reversal theory concerning the nature of motivation. In the case of the cyclist travelling to work cited by Apter, the motive for his behaviour concerned the achievement of a goal. In order to understand why this goal attains significance for the person it is necessary to understand how this person views this goal or, in other words, to understand his meta-motives. A meta-motive is a way of 'interpreting some aspect(s) of one's own motivation' (Apter, 1982, p.266); more simply, they are frames of mind which determine certain general phenomenological characteristics of motivation at a given time - they are the modes within which specific motives occur at specific times and which give rise to action.

Another way of considering meta-motivational states is to consider them as alternative modes of experience within which a person is able to assign meaning to their actions, lack of action or intended actions. Indeed, this formulation of modes of experience as alternatives has predominated in the development of the theory. It is proposed that there are a variety of meta-motivational modes which display polarity. That is, one meta-motivational mode (ie, conformity) is paired with an opposite meta-motivational mode (negativism) and these provide alternative frames of mind in which motives can be viewed by the person.

Furthermore, a number of related propositions concerning these meta-motivational modes are made within reversal theory. These are :

1. Meta-motivational modes relate to preferred levels of particular variables

For example, the meta-motivational mode most concerned with felt-arousal are referred to as the 'telic' and 'paratelic' (examined in detail later in this chapter) meta-motivational modes. The variable with which these modes are operationally defined are felt arousal and hedonic tone. In terms of the impact being in one or other of these meta-motivational modes has upon human action, it can be said that this pair of meta-motivational modes seeks to regulate the relationship between arousal and hedonic tone.

2. For a given pair of meta-motivational modes (ie, telic-paratelic) the person can be said to be experiencing their motives within one or other at any given moment in time.

The two meta-motivational modes associated with a given polarity are mutually exclusive. A person is operating within either the negativistic or conforming, telic or paratelic frame of experiencing at any given moment in time. This is an important point. It suggests that to understand the meaning a person attaches to their motives for action it is necessary to recognise both the way in which the meta-motivational polarity is understood by the person and the particular meta-motivational mode they are experiencing at the time in question. It is also an important point in understanding the psychological system proposed within reversal theory. For if a particular meta-motivational mode is seeking to maximise felt arousal so as to increase feelings of pleasure (as is the case with the paratelic mode) and its opposing polarity is

seeking to minimise arousal so as to maintain pleasure within tolerable limits (as is the case with the telic mode) then these modes are logically and psychologically mutually exclusive.

3. A person will reverse between alternate meta-motivational modes
Given that specific pairs of meta-motivational modes constitute alternative ways of experiencing relationships between particular psychological variables (ie, felt arousal and hedonic tone) then it is probable that individuals will reverse between these modes of experience. This is because the polarities of meta-motivational modes are said to operate as a bi-stable system.

Reversals between alternative modes of experience may occur for a variety of reasons. Apter (1982) identifies three : (a) contingent events - internal or external events which induce a need to reverse from one meta-motivational mode (eg, paratelic) to another (eg, telic) since the qualities of that event require this response; (b) frustration - when a person has spent a time in one meta-motivational mode but has not been able to regulate the variable associated with that mode reversal may occur; and (c) satiation - following a period in one mode an innate force for change of mode develops, sensitising the person to the two other "triggers" to reversal - should satiation be strongly felt this may of itself induce a reversal.

These three propositions involve a great many of the elementary propositions within reversal theory which are explored in detail in Smith and Apter (1975), Apter (1979; 1982), Svebak (1982) and elsewhere. These three propositions establish, for this study, the status of the meta-motivational mode 'telic' and 'paratelic' to be described in detail below. Before looking in detail at this pair of meta-motivational modes, it is

important to examine two other general features of meta-motivational modes within reversal theory. These are : (a) the concept of dominance and the relationship between dominance and a trait; and (b) the phenomenological grounding of reversal theory.

Dominance and Traits

A person is said to operate within one or other of the pairs of meta-motivational modes associated with a given polarity : they are at a given moment in time operating within the telic or paratelic mode. Whichever mode is current at a given time is referred to as the operative mode. During the course of a typical day, a person may reverse between telic and paratelic modes with some regularity, as is the case with Anne described in detail by Blackmore and Murgatroyd (1980). Over the course of time, a person may reverse between opposite modes but spend a considerably greater time in one mode; to the extent that this occurs, a person can be said to be mode dominant. As Apter (1982) notes, the person is predisposed to spend more time in one mode than in another. Thus, a person predisposed toward the telic mode can be said to be telic dominant and a person predisposed to the paratelic mode can be said to be paratelic dominant. This is not the same as saying that the operative mode will always be the same as the dominant mode, for it is suggested that the person will reverse to the alternative mode with some regularity. Rather, the mode dominance of the person suggests the mode in which they will spend most time.

Insofar as the person exhibits bi-stability in relation to polarities of meta-motivational modes, the concept of mode dominance differs from the concept of trait when this latter concept is defined as "an enduring personality characteristic" (Kline, 1976). In terms of the theory of

reversals, the term trait is defined in Allport's terms as 'a generalised system, peculiar to the individual, with the capacity to render many stimuli functionally equivalent, and to initiate and guide consistent (equivalent) forms of adaptive and expressive behaviour' (Allport, 1937). Rather than being an enduring characteristic, mode dominance is regarded as a general predisposition which initiates and guides adaptive and expressive behaviour and only in this sense is mode dominance equated with a trait.

Reversal Theory and Phenomenology

Reversal theory claims to be a structural phenomenological theory of human action (Apter, 1981; Apter, 1982). That is to say :

- (a) The meta-motivational modes within which a person experiences motives and engaged in action are defined phenomenologically. Whilst the theory of reversals provides a broad pattern for understanding such phenomenological fields (Snygg and Combs, 1949), the precise fabric of these fields (the detail within the structure) will vary considerably from individual to individual.
- (b) The theory is a theory about the patterning and structuring of experience - it focusses upon the different ways in which the contents of experience (specific actions) are interpreted by the individual rather than upon the contents themselves, though the two are clearly closely related.
- (c) The theory is concerned with relating the structures within which a person experiences their phenomenological world to the structuring of experiences within organisations and society, not simply with

individual behaviours or actions. To this extent, it is concerned with social psychological matters (Apter and Smith, 1983) as well as personality related concerns (Apter, 1982).

- (d) Finally here, the theory is concerned to examine the individual holistically rather than atomistically. For this reason the theory has examined the structural phenomenological properties of a variety of actions not generally examined in psychology. For example, it seeks to examine religious experience, humour, paradoxical behaviour and family life.

Smith and Apter (1975) and Apter (1982) claim that the theory is phenomenologically grounded in the clinical experience of Dr KCP Smith (a consultant psychiatrist), Dr Michael Apter's psychological work over two decades and the related work of a great many other psychologists associated with the theory.

Telic and Paratelic Meta-Motivational Modes

To this point the theory of psychological reversals has been presented in terms of the structural properties of the meta-motivational modes within which individuals experience thoughts, feelings and actions. Only passing reference has been made to the ways in which these concepts, constructs and processes relate to daily experience. In this sub-section, a particular pair of opposing meta-motivational modes will be described and examples of their relevance both to the study of human action and to the theory of reversals will be given. The modes to be described are the telic and paratelic modes, since these modes form the theoretical basis for the Telic Dominance Scale. It should be noted that reversal theory posits

the existence of a variety of meta-motivational modes and two other opposing pairs have been described within the framework of the theory (negativism - conformity and mastery - empathy). The telic-paratelic pair and the most thoroughly understood and researched within the theory to date.

The term 'telic' is derived from the Greek word 'telos' meaning 'an end'. In reversal theory, the terms telic mode or telic state refer to a phenomenological condition in which the 'individual is primarily orientated towards, or feels the need to be primarily orientated towards some essential goal or goals'. (Apter, 1982 p.47); the term 'primarily orientated towards' refers to the fact that in this mode the pursuit of goals which the person regards as essential is a central feature of that person's motivated actions at that time. It is important to recognise here a distinction between the content or fabric of experience and the structure of that experience. The term 'telic' is not used to describe the goals and behaviours as they present themselves as part of the content or fabric of consciousness; rather, the term telic is used to refer to the ways in which such fabrics are given structure and meaning in consciousness, (Apter, 1979). In this sense a distinction is drawn between motives (as these relate to content or fabric) and metamotives.

The term 'paratelic' refers to the opposite modality - a mode in which "the individual is primarily orientated towards or feels a need to be primarily orientated towards some aspect of his (or her) continuing behaviour and its related sensations" (Apter, 1982, p.47). That is, the person is "here and now" orientated rather than goal achievement orientated.

The distinction between telic and paratelic modes relates not only to goal direction. Table 1.1 below summarises some of the other key differences between the two states in terms of three features : (a) means-ends or goals; (b) the way in which time is perceived and (c) the intensity with which experiences are engaged. A full explanation of all the terms, adjectives and phrases used in this Table will be found in Apter (1982)

	TELIC	PARATELIC
Means-Ends Dimension	Essential goals Imposed goals Unavoidable goals Reactive Goal-orientated End-orientated Attempts to complete activities	No essential goals Freely chosen goals Avoidable goals Proactive Behaviour-orientated Process-orientated Attempts to prolong activity
Time Dimension	Future-orientated 'Points beyond itself' Planned Pleasure of goal anticipation High significance preferred	Present-orientated 'Sufficient unto itself' Spontaneous Pleasure of immediate sensation Low significance preferred
Intensity Dimension	Low intensity preferred Synergies avoided Generally realistic Low arousal preferred	High intensity preferred Synergies sought Make-believe prevalent High arousal preferred

TABLE 1.1 : Contrasting Characteristics of the Telic and Paratelic States
(from Apter 1982:52)

at pages 49 - 58. It is important to note here that a telic dominant person would :

- * see themselves to be engaged in the pursuit of externally imposed goals which they regard as both unavoidable and essential;

- * regard the achievement of a goal as more important and rewarding than the processes used to achieve the goal ;
- * be highly planning and future orientated ;
- * prefer low arousal and simplicity rather than complexity.

In contrast, the paratelic dominant person would :

- * see their current behaviour and activity as the most rewarding feature of their experience, more so if they felt that they had freely chosen the activity and that it contained a variety of immediate pleasures ;
- * act spontaneously and cancel plans made or change decisions, especially if these actions extended the duration of a satisfactory activity ;
- * seek out arousal, sometimes using make-believe and often making situations more complex to increase their "stimulus value".

These descriptions emphasise that there are three dimensions of importance in evaluating the extent to which the person is telic or paratelic dominant and these are given in Table 1.1. In this study (much of which predates the presentation of the table reproduced here) the three dimensions are referred to as : (a) seriousmindedness; (b) planning orientation and (c) arousal avoidance.

The identification of these three dimensions or critical determinants, of

this pair of meta-motivational modes gives emphasis to the motivational nature of these modes, since all three dimensions are directly related to motives. Each of the dimensions is intended to reflect the extent to which a person is orientated to act in a particular way. To this extent, meta-motivational dominance is a special kind of personality description, since meta-motivational modes influence (and sometimes determine) the way in which motivations are expressed in behaviour.

Conclusion

This chapter has provided a description of the telic and paratelic meta-motivational modes, the relationship between modes linked through bi-stability and the nature of dominance. The theory of a psychological reversal is complex. It has not been the intention to describe this theory fully, (but see Smith and Apter 1975; Apter, 1982), but rather to describe clearly those features of the theory relevant to the present study.

CHAPTER TWO

THE CONSTRUCTION OF THE TELIC DOMINANCE SCALE

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Introduction

In the previous chapter the theory of reversals was outlined by reference to the concepts of 'polarisation', 'reversal' and 'synergy'. A description of the 'Telic' and 'Paratelic' states and traits were also given. This dimension has been used as a primary dimension in the development of the theoretical materials provided by Apter and Smith (1975), especially in relation to humour (Apter and Smith 1977), the family (Apter and Smith 1979) and sexual behaviour (Apter and Smith, 1978).

As indicated, these two forms of personal orientation are grounded in the clinical observations of Smith over a twenty five year period and in the re-interpretation of experimental data from social and clinical psychology offered by Apter. But this grounding of these constructs does not serve to validate them or create a basis for reliably measuring the extent to which a person is more likely to be telic than paratelic at a given time or the extent to which individuals are likely to be dominantly telic or paratelic. This is because broad conditions for ascribing a person to a category along a telic-paratelic dimension, such as the conditions defined in Figure 2.1 below, permit wide variations in interpretation and do not encourage an empirical approach to personality classification.

TELIC ORIENTATION	PARATELIC ORIENTATION
Goal orientated	Behaviour orientated
Reactive	Active
Reality orientated	Make believe orientated
Seeks low arousal	Seeks high arousal

Figure 2.1: Characteristics of the Telic and Paratelic Orientations.

For a theory which sets out to be testable by reference to empirical data, it is necessary that an instrument be developed which permits the reliable and valid measurement of telic and paratelic dominance.

In April 1976, a 69 item inventory, then called a 'Reversals Inventory', was piloted by the Reversals Study Group. The 69 items were selected from a pool of 90 items by a panel of five judges using face validity criteria. Each item required the respondent to choose between two alternatives which were seen to represent telic-paratelic choices. The face validity of each item was determined by the judges in terms of the extent to which each item was seen to represent telic and paratelic alternatives. Typical of such items were :

TELIC	PARATELIC
Planning ahead	Taking each day as it comes
OR	
Always having to be busy	Happy to waste time

Respondents were to be asked to make a choice between each alternative for each of the items in the inventory. A not sure option was also available to respondents. The inventory was to be scored in a telic direction (ie, telic choices scored as 1, paratelic choices scored as 0, not sures scored as .5). The instructions for these choices read as follows :

'If you had the choice, which of the following items would you usually prefer, or which most nearly applies to you'.

Each item included in the inventory had been allocated to one of three

sub-scales by the judge who had selected the items from the original pool of 90. The three sub-scales were :

Seriousmindedness - the degree to which an individual is orientated towards goals which he himself sees as being essential to or important to himself, physically or psychologically rather than goals which he himself sees as being trivial, arbitrary or inessential.

Planning Orientation - the degree to which the individual plans ahead and organises himself in the pursuit of goals, rather than taking things as they come. That is, it is the degree to which a person is orientated towards the future rather than the present and the extent to which he gains pleasure from the achievement of goals or in anticipating goal achievements rather than from immediate behaviour or sensations.

Arousal Avoidance - the degree to which an individual avoids situations which generate high arousal and seeks situations in which arousal levels are low.

Through this thesis these scales will be referred to as 'SERIOUS', 'PLANNER' and 'AVOIDER'. *

The three sub-scales all relate to the telic/paratelic dimension and the

* These labels are used throughout this thesis because they constitute valid names for variables (ie, they have less than eight characters) within SPSS.

SERIOUS sub-scale is seen to contribute the 'defining characteristics' of this dimension. But the sub-scales are not seen to be logically connected :

'Although there is no necessary connection between each of these three sub-scales..... the theory of reversals suggests that there will in fact be a close relationship between them.'

The reasons for this are (a) seriousmindedness is regarded in the theory of reversals as a determining characteristic of a planning orientation, (b) arousal avoidance is a characteristic of the telic system and should therefore be related to other characteristics of that system. These assumptions are examined empirically below.

Item allocation to each sub-scale was achieved through a process of negotiation between the 'judges'. Because of a lack of information as to the nature of judgements at this phase of item selection and sub-scale construction, some doubt must inevitably be cast on the objectivity of the criteria used to select items for inclusion in a particular sub-scale. Clearly, face validity criteria were again used. As Brown (1976) has indicated, 'face validity is determined by a somewhat superficial examination of the test' (p. 127). A more systematic approach to item selection at this stage might have been desirable. But at some point in the construction of a personality inventory subjective decisions about some items will be made, especially in the early period of test construction.

Responses are scored in a telic direction. A telic is scored as 1 and 'not sure' choices are scored as .5. The scoring of 'not sure' responses

in this way is a common practice in inventories of this kind.*

Scores for each sub-scale are obtained and summed to give a total score which acts as an indicator of the telic dominance of each respondent. The higher the score, the greater the telic dominance..

A copy of the Reversal Inventory is given in Appendix 1.

Item Analysis of the 'Reversals Inventory'

An opportunity sample of 119 adults, consisting of 55 persons from a variety of occupations classified as being lower middle class, 32 undergraduate students of psychology, 6 undergraduate students of religion, 22 undergraduate students pursuing foundations courses with the Open University and 4 University laboratory technicians were used as a basis for item analysis. Data on the background of subjects was excluded from the analysis procedures reported and the available data from this analysis is presented in this thesis. The data obtained from these subjects (S's), indicated that the distributions of scores for each of the sub-scales, and hence for the total score, approached normality. Table 2.1 provides this data.

Using kurtosis as an indicator of the height of the distribution curve (0 = perfect normal distribution), it will be noted that the high negative 'peak' reported for 'AVOIDER' indicates a degree of platykurtosis.

* See for example Eysenck, M and Wilson, G (1975) : Know Your Own Personality. London : Temple Smith.

	SERIOUS	PLANNER	AVOIDER	TOTAL
MEAN	8.49	9.60	8.13	26.11
S.D.	3.60	3.60	3.60	8.86
SKEWNESS	.18	- .01	- .11	.002
KURTOSIS	- .462	.45	-1.09	- .425

TABLE 2.1 : Means, Standard Deviations, Skewness and Kurtosis for the Sub-scales and Total Score of the Reversal Inventory for SAMPLE 'A' (N=119) (Reversals Study Group, 1976).*

That is to say, the distribution curve appears flat when plotted. When coupled with a negative skew of .11 (0=normality), it seems that the scores are clustered slightly to the right of the mean with the most extreme values to the left.

Despite the small negative skew and the relatively high degree of platykurtosis observed, the AVOIDER sub-scale correlated significantly with the PLANNER and SERIOUS sub-scales as well as with the total score. Table 2.2 gives this data. It will be noted that all correlations show significance at $p < .01$. It will also be noted that, though significant

	SERIOUS	PLANNER	AVOIDER	TOTAL
SERIOUS	-			
PLANNER	.632	-		
AVOIDER	.351	.470	-	
TOTAL	.810	.870	.72	-

TABLE 2.2 : Intercorrelations Between Sub-Scales and Total Scores for 'Reversal Inventory', SAMPLE 'A' (N = 119).

* Originally presented in Reversals Study Group (1976): A REVERSALS INVENTORY (1976). Bradford-on-Avon: Reversals Study Group.

at $p < .01$ the correlations between AVOIDER and SERIOUS indicates a considerable difference in the degree of sub-scale correlation. Indeed this difference is significant at $p < .05$.^{*} This indicates that the AVOIDER sub-scale is quite distinct from the SERIOUS sub-scale. Thus, though AVOIDER is clearly associated with each of the sub-scales and hence the total score, the level of association is significantly weaker than the level of association for SERIOUS or PLANNER. As a measure of total scale: sub-scale reliability the alpha coefficient was used. Table 2.3 gives the alpha coefficients for each sub-scale and the total score, all of which show high reliability at $p < .01$. Interestingly, the AVOIDER sub-scale is, relatively, the most reliable sub-scale, though differences between the alpha coefficients are slight.

	SERIOUS MINDEDNESS	PLANNING ORIENTATION	AROUSAL AVOIDANCE	TOTAL
Alpha	.691	.655	.734	.837

TABLE 2.3: Alpha Coefficients for Each Subscale and the Total Score (n=119)

* Using the Fisher z transformation and the procedures given in Guilford and Fruchter (1973, 5th Ed.) for examining differences between correlation and coefficients (see pages 166-167), the differences in z's deviates from 0.0 to the extent of -2.740.

Item Exclusion

Following from this data analysis, items were excluded from the second version of this inventory if they were seen to be ambiguous or not to discriminate between telic and paratelic orientations.

Operationally, an item was seen to be ambiguous if 10% or more of respondents used the 'not sure' response or, in comments made by respondents, ambiguity was indicated. An item was not seen to discriminate if 85% or more of the respondents used either the telic or paratelic response. On these criteria 12 items were excluded.

Further items were excluded using an item:sub-scale and item:total score criterion. Items for which the biserial correlation coefficients between either item:own sub-scale or item: total score were $< .237$ were excluded, since r 's had to reach $.238$ to be significant at $p < .01$ for an n of 119. Two items were excluded using this criterion.

Using these three criteria (ambiguity, discrimination, association) to exclude items left an uneven number of items in each of the sub-scales.

The Reversals Study Group (1976) indicate that :

'It was decided that all sub-scales should be of equal length, and that the length of the sub-scales should be 14 items, this being the size of the scale with the smallest number of items at the completion of stage 2 of the item analysis'.

Items were excluded on the basis that they were weakest in their association with the sub-scale score.

There are other reasons for preferring sub-scales of equal lengths. These include (a) the fact that it will be convenient for future research to make the sub-scales directly comparable with each other without further computation; (b) the total score is not unduly weighted by any single sub-scale; (c) having an even number of items in each sub-scale will permit the ready delineation of telic or paratelic respondents, since account need not be taken of differential sub-scale weights.

The Telic Dominance Scale

As a result of the procedures outlined in the preceding section, 42 items each allocated to one of three sub-scales, each seen to discriminate between telic and paratelic orientations and each having been examined for ambiguity, discrimination and association, were used to form the Telic Dominance Scale (1976) which is the subject of this study. The major purpose of this study is to examine the extent to which the TDS has validity both (a) as a measure of a person's telic dominance and (b) as a reliable instrument which can be used in subsequent research.

A copy of the 42 item TDS is given in Appendix 2.

CHAPTER THREE

THE VALIDITY CONSTRUCT AND ITS OPERATIONALISATION

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The Validity Construct

Though a variety of definitions of validity have been proposed, the most common is given by Vernon (1963, p.213): 'a test is valid insofar as it measures whatever it is supposed to.' This definitional stance gives emphasis to the nature of the measurement processes utilised by the researcher and to the researcher's claims to represent a particular criterion or dimension by the measurement he obtains. As Kerlinger (1973, p.457) observes, 'there is no one validity' and a test or personality measure may be valid simply in terms of 'the scientific or practical purposes of its user' (p.457). As an illustration, Kerlinger cites the contrast between the researcher who wishes to develop a personality test which measures a particular trait and the researcher who wishes to develop an instrument which best predicts a specific behaviour. Whereas the former will need to be particularly interested in the content domain of the test, the latter is more likely to be interested in the success with which predictions can be made.

Following considerable debate, the American Psychological Association (APA) in association with the American Educational Research Association (AERA) and the National Council on Measurements Used in Education (NCMUE) prepared a classification of validity procedures which owes much to Cronbach (1966, 1971). This classification gives particular emphasis to content, criterion-related, factorial and construct validity, all of which are to be described in this chapter. Before examining the theoretical foundations of each of these constructs and procedures, it is first necessary to explore the theory of data upon which such models of validity are based.

'Data' Assumptions and Validity

Two major assumptions are made about 'data' when the validity of an instrument is being assessed. First, it is assumed that the items which constitute the test in some way reflect the content domain of the trait or phenomenon being measured. That is to say, a test item must be seen to relate, on the basis of inspection, to the kind of item that one might expect to find when attempting to measure a particular phenomenon. For example, if a test intended to measure understanding of a statistical concept, such as correlation, an item which asked respondents to agree or disagree with the statement 'a correlation coefficient tells us whether X caused Y' would be seen to possess face validity whereas a statement 'correlation concerns the way religious beliefs affect the way in which numbers are perceived' might not be seen to have the same face value.

The face validity assessment of a test follows a process similar to that described by Coombs (1964). For the decision to include an item or to exclude an item on the grounds of face validity illuminates the fact that decisions about content reflect a priori decisions about theory. As Coombs expresses this ; 'all knowledge is a result of theory.....facts are inferences and so also are data and measurements and scales' (p.5). This is best explained in terms of a simple diagram from Coombs given as Figure 3.1 below.

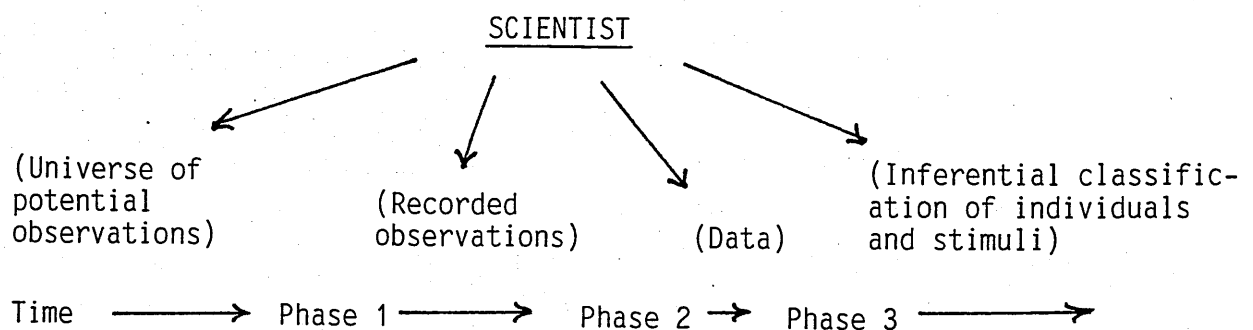


Figure 3.1: Coombs (1964) Model of Data

The model implicit in the figure above is a model that has value in explaining the relationships between data and theory in a variety of contexts. Here it is used specifically in relation to the construction of a test. The researcher begins at Phase One by making decisions about that which he is and is not going to record and observe. In certain forms of social scientific research, such as experimental studies, this may be determined by reference to a specific hypothesis. In other forms of social research, such as ethnographic studies, the hypothesis may be general rather than specific and may relate to a research setting (such as a school) rather than to specific sets of relationships between some phenomena whose properties are known. In relation to a test such as the TDS, the researcher has delineated three areas of characteristic behaviour which together are seen to constitute a trait (telic dominance) and forty-two items have been selected which, it is thought, measure this trait. Thus 'Phase-one' decisions reflect the theoretical assumptions which are made about the nature of the trait 'telic dominance' and about the face validity of the items which constitute the instrument by which this trait is to be observed.

At Phase Two the researcher applies an additional set of assumptions which must be congruent with the theoretical assumptions used at Phase One. For the researcher now wishes to convert recorded observations - responses to the forty-two items of the TDS, for example - into data. As Coombs (1964, p.4-5) states, 'phase two involves a classification of the observations in the sense that individuals and stimuli are identified and labelled, and the observations are classified in terms of a relation of some kind between individuals and stimuli, or perhaps between stimuli.' In the case of the TDS this involves (a) crediting scores on a particular item to a particular sub-scale, (b) decisions about the direction in which an item is to be scored and (c) decisions about the scoring of not-sure responses.

Such decisions relate primarily to the theoretical basis upon which the test has been constructed. For example, items are scored in a telic-direction because the instrument attempts to measure telic dominance. But computational and statistical concerns also affect such decisions. For example, if 'not sure' responses to the TDS were excluded and each item was to be a dichotomous choice, then it would become possible to use responses in multiple regression since they could be treated as 'dummy' variables (Kerlinger and Pedhauzer, 1973).

At Phase Three, the researcher is in a position to begin to use data for the purpose of theory construction or theory-testing since he can begin to develop an understanding of relations, order and structure within the data which follow logically from the theory with which he began Phase One. It is at Phase Three that the procedures for construct, factorial and criterion-related validity can be most fully utilised.

Throughout the process described here, the importance of logical relations (or praxis) between the theoretical considerations which prompted the research and the operational procedures for data collection have been emphasised. For if the relations between the items selected and the universe of items available in the content domain as specified by the theory is poor then the processes of data definition and theory testing are substantially weakened. The realisation of the inter-dependence of each phase upon the sum of the preceding phases is what gives rise to the question of validity.

The second set of data assumption in relation to validity concerns reliability. For, as Brown (1976, p.63) and many others observe, 'low error variance (ie, high reliability) is a necessary, but not sufficient,

condition for high validity.' The relationship between validity and reliability is perhaps most clearly seen if the statistical assumptions underlying the reliability and validity constructs are stated.

Reliability refers to the precision of measurement (Roscoe, 1969, p.101) or, more clearly, 'the ratio of the true score variance to the observed score variance', given that the actual scores obtained by an individual on a test contain the 'true' score plus some measurement error. These two ideas, that actual scores (x_i) contain a true score (t_i) and an error term (e_i) and that reliability is the ratio of the true score variance (σ^2_t) to the actual score variance (σ^2_x) may be expressed mathematically.

First, the nature of the actual score is given by either

$$(a) \quad x_i = t_i + e_i$$

$$\text{OR} \quad (3.1)$$

$$(b) \quad \sigma^2_x = \sigma^2_t + \sigma^2_e$$

whilst

$$r_{xx} = \frac{\sigma^2_e}{\sigma^2_x} = 1 - \frac{\sigma^2_t}{\sigma^2_x} \quad (3.2)$$

(where r_{xx} is the expression for the reliability of the actual score (x) and σ^2_e = error variance) gives the formulation for reliability.*

Validity can also be expressed mathematically. Validity can be defined as 'the proportion of the true variance (σ^2_t) that is relevant to the purpose of the testing' (Brown 1976, p.62). This definition implies that some of the true variance will not be relevant to the trait being

* The function $r_x = 1 - (\sigma^2_e/\sigma^2_x)$ follows from the assumption that an error of measurement is as likely to be positive as it is to be negative.

examined. Thus an equation such as that given in (3.3)

$$\sigma^2_t = \sigma^2_v + \sigma^2_e \quad (3.3)$$

where σ^2_v = relevant (valid) variance and σ^2_e = irrelevant, but reliable variance becomes helpful in clarifying the sources of variance within a given test. If the equation (3.3) is substituted into (3.1) then

$$\sigma^2_x = \sigma^2_v + \sigma^2_t + \sigma^2_e \quad (3.4)$$

or, in words, 'the variability in a set of test scores is determined by the valid variance, variance attributable to reliable but irrelevant source (ie, constant errors), and measurement error variance' (Brown 1976, p.63).

It should be noted that whilst there is an inverse relationship between valid variance (σ^2_v) and error variance (σ^2_e) which permits us to claim that a decline in error variance would lead to a proportional increase in valid variance, it does not necessarily follow that low error variance (high reliability) guarantees high validity. For the remaining variance in the equation may be due to either valid variance or systematic (irrelevant) error variance.

In this description of the relationship between reliability and validity the importance of both measurement error and systematic but irrelevant variance for validity was introduced. As can be seen from equation (3.4) these two phenomena effectively determine the proportion of the valid variance in a given set of data using a form of ANOVA. In the case of personality measures this becomes particularly important, since the complexity of personality theory and of the variety of motives for specific responses is considerable, giving rise to poor reliability scores for certain individuals

and to the possibility of a considerable degree of systematic but irrelevant variance in test scores if the traits are not adequately defined and if the items do not adequately reflect the content domain of the trait. Indeed, the essential problem in the construction of personality measures is the validity problem as given in equation (3.4). Put another way, how can the sources of variance within a set of test scores be best understood and in what way is this understanding due to the features of the theoretical trait which the test is said to measure?

Personality Measures and Item Validity

Given that the demonstration of validity is an essential task for those engaged in the construction of a personality measure, it may be helpful to examine the ways in which the validity of the items which constitute such measures have been determined in the past. Brown (1976, p.361) classifies approaches to the validity of the items in a personality measure as follows : a priori, empirical keying and homogeneous keying.

A number of writers (Kerlinger 1973; Vernon 1964) indicate that many of the early measures of personality traits, such as Thurstone's inventory, were founded almost entirely upon a priori assumptions. That is to say, the items selected for inclusion in a scale were selected on the basis of face validity criteria alone. Whilst it is inevitable that in the early phase of test construction (Phase One of Coomb's model) face validity criteria will play an important part, such criteria are not of themselves valid at subsequent stages in the use of the test, especially when the test is to be used in predictive studies. Face validity limits the extent to which it is possible to make inferences from the test to behaviour, and

Vernon (1964, p.213) indicates that face validity is a procedure 'which psychometrists unanimously condemn', though he is aware that 'the apparent or face validity of a test is of considerable importance in winning acceptance from test-users and test-takers'. (p.214).

A second approach to the validity of the items which constitute a personality measure is termed 'empirical keying' by Brown (1976, p.362). This phrase is used to describe validity decisions about test items being taken by reference to the empirical relationship between an item and a criterion measure. A common application of this technique is that in which known groups are used to determine the criterion measure. For example, measures which are intended to indicate the extent of depression an individual is experiencing are validated in terms of the extent to which they successfully discriminate between diagnosed depressives and 'normals'.

As with a priori decisions about the content of a scale, the empirical keying procedure using known groups is not, of itself, a sufficient indication of validity (Cronbach, 1966). For the procedure tends to ensure that a given measure has concurrent validity, but there is no indication of the extent to which the measure will be of value in, say, discriminating between reactive and endogenous depressive or in indicating the extent of a particular depression. In order to generalise from a particular measure it is necessary to know something of the construct validity of the test.

The final approach documented by Brown (1976, p. 363-364) is that of homogeneous keying. This approach takes as its starting point the assumption that all of the items used in a particular test should correlate with each other; items which do not are thought to be measuring a different trait.

Where items within a measure are homogeneous the measure may be said to be unidimensional and to possess a degree of construct validity. But the construct validity referred to here relates specifically to the internal consistency of the measure and not necessarily to its concurrent validity or to the extent to which it is possible to generalise findings for the specific data collected through the test to general patterns of behaviour thought to be associated with the latent trait being measured. In order to determine the generalizability of a measure the procedures of criterion-related, construct and factorial validity need to be used. In doing so, the value of item analysis should not be overlooked, particularly given recent developments in item analysis techniques (Mardia, Kent and Bibby, 1979).

Validation Procedures

In the previous section, three broad strategies for determining item validity were briefly described. It was noted that whilst item analysis was a necessary pre-requisite for a test in the process of construction, the validity of the total test required techniques which looked at the predictive nature of the test as well as to its homogeneity. In this final section of this chapter, four such procedures are examined. These are : (a) content validity, (b) criterion-related validity, (c) factorial validity and (d) construct validity. Of these, content validity had been referred to in early sections of this chapter. It is, however, necessary to re-state simply the essential notions of content validity in order to provide an overview of the procedures used in test validation.

(a) Content Validity

The process of determining content validity is significantly different from the quantitative processes upon which the three procedures to be described below are founded. For content validity involves the attempt to judge whether the items included in a test adequately represent the trait which they purport to measure. That is to say, content validity is used to determine the degree of congruence between the content of test items and the characteristic of the trait or skill being measured.

Though this procedure is essentially judgmental, it is possible to examine such judgements quantitatively. For example, ratings of content validity offered by several judges can be compared so as to provide an objective measure of agreement as to the content validity of each item. Whilst the index of agreement would indicate the reliability of the judges' ratings, the actual ratings by the judges would constitute a useful validity index.

The problem of content validity studies, as Vernon (1964, p.213) indicates is that they tend largely 'to become studies of face validity.' That is to say, the form is almost entirely upon how 'good' the items 'feel' rather than a careful scrutiny of the extent to which all possible aspects of the content domain are covered by the items in the test. Studies of content validity are considerably enhanced when the content domain is clearly and precisely stated and when some, even limited, steps have been taken to quantify the judgemental process. To some extent, however, content validity is simply a rigorous form of face validity.

(b) Criterion-related Validity

Criterion-related validity takes two forms. First, this term is used to

describe a procedure in which scores on a test are correlated with a criterion measure, such as diagnosed psychological illness in the case of tests measuring (say) depression or schizophrenia, or assessments of ability in the case of tests of manual dexterity or mathematical aptitude. The procedure involves the calculation of the following 'validity coefficient' (really a bi-variant correlation measure) as given in 3.5 below :

$$r_{xy} = \frac{\sum (xy)/n - (\bar{x}) (\bar{y})}{(\sigma_x) (\sigma_y)} \quad (3.5)$$

where

x = test scores (\bar{x} =mean)

y = criterion measure (\bar{y} =mean)

n = sample size

σ = standard deviation

In this form of criterion-related validity the concern is to demonstrate the extent to which a test (\bar{x}) predicts the criterion (\bar{y}) when the measures x and y are obtained at the same time. This form of criterion-related validity is more generally known as concurrent validity.

A second procedure for answering the criterion-related validity of a test, often referred to as predictive validity, is used when the criterion measure (y) is collected at some future date. For example, if a test x is said to measure the extent to which a person is depressed, as does the Beck Test (Beck, 1967) it may be used to predict whether a person is changing from one depressive state to another. In a study of 38 depressives, the Beck Test was administered on admission and at an interval of between 2 and 5 weeks. In 33 of these cases, 'there was enough gross change in the clinical picture to warrant a change from one depth-of-depression category' as diagnosed by the clinical psychologist 'to another' and for each case the

depth of depression scores on the Beck Inventory had changed in the same direction as the clinicians diagnoses before these diagnoses had been made. It is therefore possible for the Beck Test to be used to predict clinical diagnoses of changes in depressive patients, if, that is, the predictive validity of the test continues to be experienced by its users.

Whilst criterion measures in tests of ability are relatively objective, the use of criterion measures in personality studies pre-supposes the existence of the personality trait (Ebel, 1961). That is, the criterion is an abstraction not an event or behaviour which can be observed. For this reason 'good' criterion measures are notoriously difficult to come by in the development of personality measures.

Brown (1976) suggests that criterion measures should possess four characteristics. These are :

- (a) Relevance: the 'criterion measure must actually reflect the facets of the conceptional criterion' (Brown, 1976, p.101).
- (b) Reliability: the criterion measure needs to be reliable insofar as measurement errors are controlled and tes-retest reliability studies of the criterion measure are undertaken.
- (c) Uncontamination: opportunities for bias should be excluded as far as possible.
- (d) Practical: the criterion measure should be simple to use and relatively free from bias.

In the development of personality measures, such as the Minnesota Multiphasic Personality Inventory (Hathaway and McKinley, 1942), the criterion measures used are usually psychiatric diagnoses of patients against a 'normal population' (see Anastasi 1968, p.442), though in the construction of the masculinity/femininity scale the criterion measure was the sex of the respondent. But in scales which are not intended to predict the nature of the extent of a psychological illness the selection of a criterion measure is particularly difficult. Researchers tend to use ratings by judges trained to observe or interview as criterion measures (Guilford, 1973, p.456), even though there is the possibility of bias in such scores.

The use of criterion measures provides the researcher with the ability to examine the predictive validity of a particular measure whether or not the data relating to the criterion was collected concurrently with the test data. For, using regression analysis, the extent to which a test predicts a criterion can be examined using a measure of goodness of fit, such as the F ratio.

The bivariate correlation given in (3.5) above permit a simple measure of association between (x) and (y) where y is the criterion measure and x the test score. The resulting statistic, r_{xy} is useful for two reasons. First r provides a measure of association between the two variables x and y. Second, r_{xy} permits the researcher to indicate the extent to which the variance in y can be determined by x. Given this last property, r^2 permits an examination of the variance in the residuals.

$$x_{\text{resid}} = 1 - r_{xy}^2 \quad (3.6)$$

Put simply, x_{resid} is the amount of variance in the y scores that cannot

be determined from calculations involving x.

The concern in regression analysis is to examine the extent to which y's can be predicted by x's. This is achieved through the use of the equation given in (3.7) below

$$Y^1 = a + bx \quad (3.7)$$

where

Y^1 = predicted score in the y variable

a = the constant indicating the point at which x intercepts y

b = regression coefficient

x = score on the independent variable

To calculate b the formula (3.8) is used :

$$b = \frac{\sum_{xy}}{\sum_x} \quad (3.8)$$

and a is calculated by (3.9) :

$$a = \bar{y} - b\bar{x} \quad (3.9)$$

where \bar{y} and \bar{x} are the means of y and x respectively

The purpose of calculating Y^1 is to examine the extent to which the x variable (test score) predict the y variable (criterion measure), the basic proposition being that tests where $y=Y^1$ have high criterion-related/predictive validity. More detailed descriptions of regression techniques are given in Kerlinger and Padhauzer, (1973).

Regression analysis was used in the validation of the Brown-Holtzman Survey of Student Study Habits (Holtzman and Brown, 1968) where grade point average

was used as the criterion measure. In a study of 1,684 seventh grade students, Holtzman and Brown found that they were able to account for 52% of the variance in grade point averages (the y variable) by reference to study skills and study attitudes and that the predictive ability of their test was high. Similar techniques have been used with other measures (see Kerlinger, 1973, p.604 - 611).

Where the criterion measure consists of group membership (ie, normal or schizophrenic, or successful or unsuccessful), and only two categories are used as criteria scores, a number of techniques are available to the researcher concerned with the prediction validity of a test.

First, the researcher may use a t-test to examine whether groups differ significantly on the test scores they obtain. The formula for a t-test is given in (3.10) below:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{(\theta_1^2/n_1) + (\theta_2^2/n_2)} \quad (3.10)$$

\bar{x}_1 and \bar{x}_2 are the mean scores of group 1 and group 2 respectively, and where

θ_1^2 and θ_2^2 are the variance of group 1 and group 2

n_1 and n_2 are the sample sizes of group 1 and group 2

The function of the test is to determine whether the groups differ significantly in the way in which they respond to a particular test. One difficulty associated with the use of the t-test is that differences between means, central to this statistic, are a function of the sample size of the two groups.

An alternative analytic procedure - discriminant analysis - is available in cases where the sample size is likely to affect the means and thus make the use of the t-test questionable. In discriminant analysis an attempt is made to find out whether there is a compound score of test variables (ie, item responses or sub-scale scores) that differentiate optimally between given groups and to find out how far this compound variable (factor) can be used to predict group membership (Van der Geer, 1971, p.243). Discriminant analysis also makes use of the mean, for the decision formula is given as :

$$(x_i - \bar{x}_1)^2 (x_i - \bar{x}_1) < (x_i - \bar{x}_2)^2 (x_i - \bar{x}_2) \quad (3.11)$$

where

$(x_i - \bar{x}_1)^2$ is the predicted distance between a score or compound variable x_i and the predicted mean of group 1.

$(x_i - \bar{x}_1)$ is the actual distance between a score or compound variable x_i and the mean of group 1.

$(x_i - \bar{x}_2)^2$ is the predicted distance between scores and the mean of group 2.

$(x_i - \bar{x}_2)$ is the actual distance between the compound scores x_i and the mean of group 2.

It should be noted that discriminant analysis does not use the variables which might result from the administration of a particular test in the predictive equation but rather uses a compound of such variables for the purposes of conducting a 'profile' which will be used in discriminating between two groups. In this the technique of discriminant analysis is very

similar to the techniques employed in multiple-correlation and multi-variate regression analysis, with the exception that the latter techniques assume metric properties for the criteria (dependent) measure whereas in discriminant analysis the variable is dichotomous.

Finally, in dealing with a criterion which is dichotomous, the researcher may use regression analysis if he treats the criterion measure as a 'dummy' variable. A dummy variable is one 'in which members of a given category are assigned an arbitrary number, while all others - that is, subjects not belonging to the given category - are assigned another arbitrary number. The resulting variable is a dummy variable.' (Kerlinger and Pedhauzer 1973, p.105). Such variables can be used as both independent and dependent variables in regression analysis and the analysis of variance and they possess the qualities of metric data.

Given the statistical techniques available, the analysis of criterion-related validity would appear to be a more objective approach than either face-validity or content-validity approaches to validity determination. But this is only the case if the criteria measure is adequate. It is interesting to note that if the criteria measure has poor validity and reliability the use of criteria-related validity procedures may well produce statistically significant results which are not logically significant. For unless the criterion measures satisfy the conditions outlined above, its use as a criterion measure will not reveal much about the validity of the test.

(c) Construct Validity

Construct validity may be defined as 'testing out the theory underlying the test, or determining the psychological nature of the test score',

(Vernon 1964, p.216). It is a particularly important form of validity determination for, as the American Psychological Association 1966 test standards state, it is used when :

'The test user wishes to infer the degree to which the individual possess some hypothetical trait or quality (construct) presumed to be reflected in test performance'. (p.12)

Construct validity requires that specific hypotheses derived from the theory which gave rise to the test be empirically tested so that the validity of both the theory and the test may be examined. Five procedures are available to the researcher seeking to undertake the construct validation of a given test. These are (1) intratest methods, (2) intertest methods, (3) criterion-related methods, (4) experimental manipulation and (5), generalizability studies.

(1) Intratest Methods is a term used to refer to techniques of item analysis, briefly described below. Whilst such techniques may tend to focus upon test homogeneity using either the alpha coefficient or the Kuder-Richardson coefficient, the general purpose of intratest methods of construct validation is concerned with process analysis. That is to say, the focus of intratest methods is upon 'the skills, abilities and reaction tendencies' the person brings to bear when responding to the test (Brown, 1976, p.132).

For example, Farley and Goh (1976) studied the PEN inventory of Eysenck and Eysenck (1969) which measures psychoticism, extraversion and neuroticism. By asking three groups of students to complete the PEN inventory in quite different ways - Group A were asked to complete the inventory as if they were presenting the worst possible impression of themselves, Group B the best possible impression, and Group C were

asked to complete the inventory under the normal conditions - Farley and Goh were able to demonstrate that the neuroticism component of this test was 'particularly susceptible to social desirability responding'. This study may thus be regarded as a detailed study of the process of test completion.

(2) IntertestMethods is a term used to describe the extent to which an inventory measures that which other measures of the same trait measure. For example, new IQ tests are generally validated against accepted and validated IQ tests such as the Stanford-Binet or WISC. A new measure of extraversion - introversion could be correlated with the measures of this dimension offered by Cattell or Eysenck.

The principle intertest analysis techniques are those of bivariate correlation when the new test is correlated with one other measure and factor analysis when there are several measures to be correlated with the new test. The aim of these techniques is to establish the extent to which tests said to measure the same construct (extraversion, for example) share a common variance. Campbell (1957), developing earlier arguments (Campbell and Fiske, 1959) suggests that, in intertest studies, a test should display both 'convergent' and 'discriminant' validity. That is, tests should not only correlate with measures of the same construct (convergent validity) but should fail to correlate with measure of different constructs (discriminant validity). Clearly, where a test is said to measure a new trait, theoretically distinct from other traits measured by existing tests, then the test must show discriminant validity.

(3) Criterion-Related Methods have been described in some detail above.

All that need be said here is that methods employing a criterion, provided that the criterion possessed certain qualities described on page 39 above, depend for their validity upon the quality of the criterion measure adopted.

(4) Experimental Manipulation is the name given to techniques in which a specific hypothesis derived from an understanding of the construct is examined through an experiment in which there are carefully controlled experimental 'treatments'. In this form of construct validity, test scores are used to predict experimental outcomes, and some form of analysis of variance (ANOVA) is undertaken.

(5) Generalizability Studies are, following Campbell and Fiske (1959), 'multitrait-multimethod' studies in which data relating to a particular trait is obtained in several different ways and a particular hypotheses is tested by several different experimental designs.

As can be seen, the construct validity model presented here permits a great variety of designs to be used in the attempt to establish whether a given 'test measures' whatever it is supposed to. Not all of the techniques listed above would be used in the validation of a single test and not all the techniques could be used at the same time unless, of course, considerable resources are available to the researcher. But the construct validity procedures outlined here are the procedures most usually used at some stage in the validation of a test.

(d) Factorial Validity

As its name implies, factorial validity is concerned with the identification

of latent response traits evident when the factor structure of a given test is examined. As indicated above, factor analysis is a tool of both intra and intertest construct validity. In the intratest study it is used to examine the communality between tests said to measure the same trait.

The basic model of factor analysis may be given as in (3.12)

$$Z_j = a_{j1}F_1 + a_{j2}F_2 + a_{j3}F_3 + \dots\dots\dots a_{jm}F_m + d_jU_j \quad (3.12)$$

where

Z_j = a variable (j) in standardised form

$F_1 \dots F_m$ = hypothetical factors for the variable j

U_j = unique factors for the variable j

a_{ji} = standardised multiple regression coefficient of variable j on factor; - the 'factor loading' of variable j on each of the hypothetical factors $F_1 \dots F_m$

d_j = standardised regression coefficient of variable j on the unique factor U_j

Using this model for each item in a test permits an analysis of the latent structure of the data, given that the number of factors that can be extracted from a given number of items (n) is n - 1. Using this model also permits the study of intertest relationships. If $Z_1 \dots Z_n$ are taken to be a set of scores from a variety of tests then a factor model can be used to indicate (a) the extent to which the tests have certain factors in common (by examining the a_{ji}) and the extent to which a given test has a unique factor (by examining the d_j regression coefficient).

Though factor analytic methods have been widely used in test construction, particularly following Cattell (1946) and Eysenck (1952), to establish

test homogeneity and intertest validity, the technique is not without its problems.

First, a factor identified in a set of test scores may be due to the trait which the test purports to measure or to response sets or responses based on social desirability or to 'halo' effects. Vernon (1964, p.215) suggests that such effects may be regarded as 'instrument factors' rather than factors due to related to the traits being measured. The factor model given in (3.12) makes no allowances for the difference between trait and instrument factors: the researcher has to decide on the interpretation of the data produced through the use of any factor analysis model.

Secondly, even if factors are produced through the application of the model are not thought to be instrument factors, how then are such factors labelled? Anastasi (1968, p.451) offers a useful warning:

'It should be recalled that an element of subjectivity is likely to enter into the identification of factors, since the process depends on an examination of those items having the highest loadings on each factor Despite the extensive research conducted by Cattell and his associates over more than twenty years, the traits proposed by Cattell must be regarded as tentative.'

- once again decisions about the validity of a factor identified through the application of an objective technique depend, to a considerable extent, on the taken for granted assumptions made by the researcher.

Thirdly, there are a number of different methods of factor analysis and a number of different options available within a particular method. Different types of factor analysis can produce different results (Brown, 1976, p.160). This can be of major importance when an attempt is being made to identify correlated factors (oblique factors) or uncorrelated, independent factors

(orthogonal factors); different factoring procedures may result in slightly different factor models. The researcher, in deciding which techniques to use, will often seek a method which produces data of optimal value to his a priori interpretation of the tests structure. Thus the selection of factoring methods may also be regarded as a subjective decision made by the researcher and informed by the theoretical constructs upon which the test is founded.

CONCLUSION

The literature relating to validity and its measurement is large (see Cronbach, 1971) and the armoury of available procedure is also substantial. In this chapter an overview of the major techniques used and their theoretical foundations has been presented.

In reviewing the available techniques it should be noted that not all of these techniques are applicable to all test instruments and that, even when they are, the resources required to exhaust the question 'does this test measure what it is supposed to measure?' are considerable. Indeed, this question is one which needs to be repeatedly asked of a test or measure, for the validity may change as social conditions or psychological understanding develops or changes in time. The armoury of techniques described above permit the researcher to be ever vigilant in the pursuit of valid measures.

CHAPTER FOUR

SCALE AND TEST RELIABILITY

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Introduction

In the previous chapter, the inter-relationship between reliability and validity was stated. Reliability was seen as a necessary but not a sufficient condition for validity (Brown, 1976). In this chapter data from a number of studies will be presented so as to enable the item, sub-scale and test reliability of the Telic Dominance Scale (TDS) to be examined.

The assertions being tested in this chapter may be stated as follows :

1. All items included in the TDS will correlate (at $p < .05$) with the subscale to which the item is allocated;
2. Each of the subscales of the TDS will show a high degree of internal consistency ($\alpha \geq .65$);
3. Each of the subscales will show a high degree of test-retest reliability (at $p < .01$) when the TDS is administered to subjects on two separate occasions.

The confirmation of these hypotheses would make possible certain statements about the reliability of the Telic Dominance Scale and in doing so would facilitate the validation studies which assume reliability.

Item Analysis

For the purpose of examining the reliability of the items included in the

TDS a random sample of 100 respondents was chosen from all completed scales. At the time of the analysis, the number of completed scales was 400. The subjects were male and female undergraduate students studying for social science or arts degrees at a conventional University. A sample of 100 was chosen because it was the maximum sample size for analysis using the programme available for item analysis.*

For the one hundred completed scales, the means and standard deviations for each subscale are as given in Table 4.1 below. The means and standard deviations do not differ significantly from the means for each of the sub scales observed at the time of test construction.**

	SERIOUS	PLANNER	AVOIDER
Mean	6.415	5.660	6.435
Sigma	1.989	2.072	2.323

TABLE 4.1: Means and Sigmas for Each of the TDS Sub-Scales (n=100)

Furthermore, each of these sub-scales correlate with each other at $p < .05$, as can be seen from Table 4.2. To be statistically significant at this

	SERIOUS	PLANNER	AVOIDER
SERIOUS	-		
PLANNER	.361	-	
AVOIDER	.245	.197	-

TABLE 4.2: Sub-Scale Intercorrelation for the TDS (n=100)

* Subsequent modifications to the programme permit a larger sample size to be used.

** t-tests give the following results: $S \sim t = 1.32$; $P \sim t = 1.01$; $A \sim t = 1.07$, $df > 120$

level, r needs to be equal to or greater than .195. It will be noted that whilst each of the sub-scales is related to each other, the AVOIDER sub-scale is related less strongly to the PLANNER sub-scale than is the SERIOUS sub-scale. Indeed, it is statistically significant only because the correlation coefficient is .002 greater than that required for significance at $p < .05$. As was noted earlier, the AVOIDER sub-scale seems to represent a personality feature which, whilst related to the features measured by the SERIOUS and PLANNER sub-scales, has distinctive characteristics.

In the construction of the TDS, three related criteria were applied to each item in order to determine whether the item should be included or excluded from the final version of the scale. These criteria were :

- (a) Discrimination - the extent to which the item successfully discriminates between telic and paratelic respondents
- (b) Ambiguity - the extent to which respondents feel forced to use the 'not sure' category
- (c) Association - the extent of the correlation between an item and the sub-scale with which it is associated.

These criteria are operationalised in the following way :

- (a) Discrimination is said to be present if any one response choice has less than 85% of the responses possible.
- (b) Ambiguity: an item is ambiguous if 20% or more of those responding used the 'not sure' response choice (Brown, 1976, p.280-281).

- (c) Association: is calculated using a bi-serial correlation coefficient with telic/paratelic item responses forming the dichotomous (dummy) variable and the sub-scale scores for each individual forming the continuous variable.*

The consequences of applying each of these criteria to the response choices of each of the 100 subjects to each of the 42 items of the TDs are discussed fully below. A summary of the data is presented in Table 4.3

Discrimination

Using the criteria of not more than 85% of respondents choosing any single category response it will be seen from Table 4.3 that only one item - item 15 (Taking holidays in many different places/Taking holidays in the same place) - fails to discriminate between the telic and paratelic.

If a discrimination coefficient is calculated using

$$d = \frac{\% x_1}{\% x_2}$$

where x_1 is the smaller of the two response rates and 'good' items are those with a $d \geq .8$ (Brown, 1976, p.250) then items 27, 30, 36 and 42 are 'good' having d 's of .86, .98, .82 and .84 respectively. Using this simple statistic, items which have d 's less than or equal to .5 are said to be

* For details see Guilford, JP and Frutcher, B (1973) : Fundamental Statistics in Psychology and Education. Tokyo : McGraw Hill Koyakusher pp.297-300.

		NUMBER OF RESPONDENTS		NUMBER OF NOT SURE RESPONSES				
Item No.	SUBSCALE	TELIC	PARATELIC	NOT SURE	DIS	AMBI	ASS(s)	Item No
1	PLANNER	22	76	2				1
2	PLANNER	58	38	4				2
3	AVOIDER	59	39	2				3
4	PLANNER	14	76	10				4
5	AVOIDER	36	59	5				5
6	PLANNER	13	54	3				6
7	PLANNER	38	59	3				7
8	PLANNER	32	55	13				8
9	AVOIDER	15	81	4			*	9
10	PLANNER	62	30	8				10
11	AVOIDER	53	33	14				11
12	AVOIDER	68	26	6				12
13	SERIOUS	23	64	13				13
14	SERIOUS	25	63	12				14
15	AVOIDER	6	92	2	*			15
16	SERIOUS	23	72	5				16
17	SERIOUS	58	32	10				17
18	AVOIDER	21	77	2				18
19	AVOIDER	67	30	3				19
20	PLANNER	25	68	7			*	20
21	AVOIDER	79	17	4				21
22	SERIOUS	34	56	10				22
23	SERIOUS	23	64	13				23
24	SERIOUS	12	84	4	*			24
25	PLANNER	42	53	5				25
26	PLANNER	72	25	3				26
27	PLANNER	44	51	5				27
28	SERIOUS	52	35	13				28
29	SERIOUS	25	64	11				29
30	AVOIDER	47	46	7				30
31	SERIOUS	67	25	8				31
32	PLANNER	29	62	9				32
33	SERIOUS	81	12	7	*			33
34	AVOIDER	15	81	4			*	34
35	AVOIDER	35	54	11				35
36	AVOIDER	49	40	11				36
37	SERIOUS	50	38	12				37
38	SERIOUS	33	60	7				38
39	SERIOUS	67	21	12			*	39
40	AVOIDER	55	43	2				40
41	PLANNER	22	71	7				41
42	PLANNER	45	38	17				42
	TOTAL	1,696	2,194	310				

Table 4.3 : Summary of Item Analysis Data (n=100). * Indicates Failure of the Item To Meet Specified Criteria.

'poor' and items less than or equal to .15 are said to not discriminate. Using this formulation, items 1, 4, 6, 9, 10, 12, 13, 14, 16, 19, 20, 21, 23, 26, 29, 31, 32, 34, 39 and 41 discriminate, but do so at a minimal level, whilst items 24 and 33 fail to discriminate.

The fact that 48% of the items in the TDS discriminate poorly is a source of concern. It should be noted, however, that the levels of discrimination may fluctuate between different samples, depending on the extent to which the sample consists of persons at each end of the telic-paratelic dimension.

The fact that two items fail to discriminate should also be a source of concern, particularly since the two of them (24 and 33) are from the SERIOUS sub-scale.

Ambiguity

Using Brown's criteria for ambiguity, none of the 42 items of the TDS can be said to be ambiguous.

Association

Table 4.3 provides a summary of the association data with an asterisk (*) marking those items which do not correlate with their own sub-scale at $p < .05$. These are items 9, 20, 34 and 39. Items 9 and 34 are from the AVOIDER sub-scale; item 20 from the PLANNER sub-scale and item 39 from the SERIOUS sub-scale.

The presence of these items would appear to weaken these sub-scales. The extent to which they do this can only be assessed by reference to the internal consistency measure (α) used below.

All of the items included in the TDS satisfy at least two of the criteria established above as essential for items to continue to be regarded as satisfactory in measuring telic dominance. The failure of an item to meet one criteria (as is the case for items 15, 24, 33, 9, 20, 34 and 39) may be due to a variety of factors, including differences in the conditions of administration between respondents, individual differences in item interpretation and the presence/absence of the personality features in the individuals tested. In future studies these 7 items (constituting 17% of the total test) should be regarded as unstable and the response to these items should be given particular scrutiny.

The most interesting feature of the item analysis summarised in Table 4.3 is the fact that, of the 4,200 responses to the items included in the TDS 2,194 (52.24% are in paratelic direction and only 1,696 (40.38%) are in a telic direction. The Telic Dominance Scale is here yielding a considerable amount of data about the paratelic choices of individuals. This feature of the item analysis gives emphasis to inter-relationship of the data codification procedures with the researcher's own taken for granted assumptions.

Internal Consistency of the Sub-Scales

The internal consistency of a test or scale is a measure of reliability. Internal consistency is usually calculated by dividing the series of items constituting a test or scale into two halves and treating these two halves as being separate tests; the correlation between the scores obtained on these two tests is then found and corrected for the effects of halving,*

* The Spearman-Brown formula for this correlation is given as

$$2r_n/(1 + r_n)$$

where r_n is the correlation between the two test halves.

thus giving an inter-test reliability coefficient.

The coefficient alpha (Cronbach, 1951) is a measure of internal consistency which is directly related to the split-half method of estimating reliability. Whereas there are a variety of ways of calculating the split-half reliability coefficients, alpha is the mean of all possible split-half reliability coefficients. Alpha can be calculated using the following formula

$$\alpha = \frac{\sum n \bar{r}_{ij}}{1 + (n-1) \bar{r}_{ij}} \quad (4.1)$$

where

n = number of test items

\bar{r}_{ij} = the average of all the inter-item correlations

- whilst this is not the 'classical' formula for calculating alpha **, it is the simplest computational formula and has been incorporated in a variety of computer assisted item analysis programmes. This formula gives particular emphasis to the interdependence of test length (n) and test homogeneity in determining test reliability.

The formulation of alpha offered here and the classical formulations cited in Guilford (1954) constitute a parametric item analysis statistic. As such, alpha presupposes that test or scale items display interval properties. A non-parametric alpha coefficient, using frequency data and

** See Guilford, JP (1954) Psychometric Methods. NY: McGraw Hill for a re-statement of Cronbach's 'classical' formulation.

the chi-square distribution, has been suggested by Trippi and Settle (1976) Requiring items to display no more than nominal scale properties, the Trippi and Settle statistic (alpha) is calculated using the following formula :

$$\alpha = X^2 / X^2 \text{ max} \quad (4.2)$$

where

$$X^2 \text{ is calculated by } \sum_{j,q} (O_{jq} - e_{jq})^2 / e_{jq}$$

$$X^2 \text{ max is calculated by } n \left(\sum_{j=1}^k (e_{jy} - e_y)^2 / e_y + \sum_{q=2}^Q e_q \right)$$

$$e \text{ is given by } \frac{\text{number of items}}{\text{number of possible item responses}}$$

and q = response category

k = total number of items

i = an item

n = an individual's response to an item.

Whilst a potentially valuable statistic, alpha has two important weaknesses. First, it is cumbersome and involves a number of computations which have to be computed independently of other computations associated with item analysis. Alpha calculated using formula (4.1) can be calculated using data shat by factor analysis programmes and is therefore less cumbersome to use. Secondly, whilst both alpha and alpha² provides coefficients in the range 0 to 1, alpha² coefficients tend to be located in a narrow range of .02 and .4 (see Trippi and Settle, 1976, p.423) whilst alpha coefficients are located fully within the range of 0 to 1 (McKenna, 1970).

The need to use the non-parametric alpha is obviated if responses to items which have more than two choice outcomes are collapsed into dichotomous

response patterns (x and not x, for example) and treated as dummy variables. Since such dummy variables display the properties of interval measures, alpha can meaningfully be used.*

In this study of internal consistency, responses to each item of the TDS were dummy coded as telic or not telic and the parametric alpha was calculated using the formula given in (4.1) above. Whilst values for alpha greater than .5 are seen to indicate 'strong' internal consistency (Trippi and Settle, 1976, p.423) a value of $> .65$ was selected as being a satisfactory level of internal consistency for the purpose of this analysis. This value of alpha was chosen as it was the lowest value for alpha detected when the 42 item scale was first constructed. Values of alpha $\leq .65$ could thus be taken to indicate that the TDS had at least the same internal consistency as it had when the original item selection was made (Murgatroyd, Rushton, Apter and Ray, 1978).

Three data sets were used for the analysis of the internal consistency of the TDS. These were :

- (a) Set One : TDS response data from experienced adult part-time students of the Open University aged between 21 and 65 (n=250)
- (b) Set Two : TDS response data from freshmen part-time adult students of the Open University aged between 21 and 65 (n=180)

* For a discussion of the use of x/not x dichotomous systems see Davies, J (1971) Elementary Survey Analysis. NY: McGraw Hill; for a discussion of the use of dummy variables see Kerlinger (1973): Multiple Regression in Behavioural Research NY: Holt, Rinehard and Winston; Nie et al (1975) Statistical Package for the Social Sciences. NY: McGraw Hill.

(c) Set Three : TDS response data from incoming undergraduate part-time adult students of the Open University (n=250)

Table 4.4 gives the relevant alpha coefficients for each of the set response sets by TDS sub-scale. As can be seen, all appear to be satisfactory given the criteria established at the beginning of this chapter (ie, alpha must equal or be greater than .65). These data also indicate that, whilst

	Set One (n=250)	Set Two (n=180)	Set Three (n=250)
SERIOUS	.652	.731	.657
PLANNER	.778	.873	.762
AVOIDER	.659	.657	.662

TABLE 4.4 : Alpha Coefficeints for Three Data Sets by Sub-Scale

the seven suspect items may have affected the alpha coefficients to some degree, their effect has not made these scales unduly suspect. Indeed, these alpha coefficients are highly satisfactory given the Trippi and Settle criteria mentioned above.

Test-Retest Reliability

Four test-retest reliability studies with four different groups of subjects were conducted in the period 1975 - 1977. The four subject groups each of which are opportunity samples, can be described as follows :

Group One : 32 students and staff of a psychology department

Group Two : 48 part-time students aged between 17 and 35 attending a technical college

Group Three : 32 undergraduate psychology students aged 18.

Group Four : 15 housewives aged between 28 and 38 attending a
leisure education programme.

The time interval between the two separate administrations of the TDS varied between groups. The shortest time interval was 6 hours (Group One) whilst the longest was twelve months (Group Four). Coefficients of reliability were calculated using a Pearson's correlation coefficient. The resultant data are summarised in Table 4.5 below. Correlations reaching statistical significance at $p < .01$ level are indicated by an asterisk.

Group	Time Between Tests	N	Sub-scale Inter-Correlations		
			Serious	Planner	Avoider
1	6 hours	32	.952*	.803*	.872*
2	6 weeks	48	.605*	.773*	.790*
3	6 months	32	.634*	.702*	.711*
4	12 months	15	.632*	.677*	.698*

TABLE 4.5 : Test-Retest Reliability Studies of the TDS for differing periods of elapsed time.

As can be seen, all correlations are statistically significant at $p < .01$, indicating that the TDS has a high test-retest reliability. Further these data demonstrate that the test-retest reliability of the TDS is not unduly affected by the period of elapsed time between the administration of the two tests, provided that the time is not greater than twelve months.*

* It may well be that this statement is true of longer time intervals. As yet, however, there is no evidence for the extension of this statement to periods of time longer than twelve months.

Had the TDS not shown this highly satisfactory level of test-retest reliability, it might have been thought that respondents were responding to each item in terms of their current preferences rather than their usual preferences, even though they are asked to respond in terms of the latter. The satisfactory reliability coefficients lends considerable support to the view that the TDS is measuring an enduring personality feature rather than the respondents 'state' as well as supporting the assertions about test reliability.

Conclusion

The chapter began with three assertive hypotheses :

- (1) That all of the items included in the TDS will correlate (at $p < .05$) with the sub-scale to which the item is allocated ;
- (2) Each of the sub-scales of the TDS will show a high degree of internal consistency ($\alpha > .65$); and
- (3) Each of the sub-scales will show a high degree of test-retest reliability (at $p < .01$) when the TDS is administered to subjects on two separate occasions.

Using a number of studies, hypotheses 2 and 3 have been satisfactorily demonstrated to be correct. Hypotheses 1 however, was not correct for 7 of the 42 items. It is suggested that these 7 items (items 9, 15, 20, 24, 33, 34 and 39) be treated as unstable, though it is noted that the internal consistency and reliability of the sub-scales are highly satisfactory.

CHAPTER FIVE

FACTOR STRUCTURE OF THE TDS

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Introduction

In Chapter Three, the nature of factor analysis was briefly described. It was suggested that factor analysis was of value in the examination of test homogeneity (intra-test validity) and in the study of the inter-relationships between sets of test scores. In this Chapter, a study of the intra-test factor structures of the TDS is presented in order that the homogeneity of the test and the validity of item : scale allocations can be examined.

Before detailing the studies conducted, it is first necessary to examine three frequently cited objections to factor analytic methods. First is often suggested¹ that there is an infinite number of possible factor analytic 'solutions' and a variety of factor analytic methods to produce such solutions : 'to trust any one solution is, therefore, foolhardy'. A second objection has been that the interpretation of factor loadings is essentially subjective, especially when 'labels' or 'titles' are attached to the factors produced by such an analysis. Finally, it is sometimes suggested that the factors obtained are only those invented by the researcher; 'non-desirable' or unimagined factors do not appear as a consequence of the application of factor analytic procedures.

Kline (1973) has commented on these objections succinctly. Firstly, in examining the 'infinity of solutions' argument, Kline notes that there are differences between simple factor structures (ie, when each variable is loaded high only on one factor and is zero and /or negative on all other

¹ Mischel, W (1968) : Personality Assessment. NY : Wiley

factors) and complex factor structures (ie, when a variable can be positively highly loaded on several factors). He suggests that the search for simple structures - a primary quest of psychologists since Thurstone (1947) - tends to reduce the number of positive solutions considerably and to provide a reliable basis for the application of factor analytic techniques (see also Cattell, 1973 : Harman, 1976).

In dealing with the argument that factor analytic solutions involve a degree of subjectivity, Kline acknowledges that this 'will always be the case', (p.66), as the brief examination of Coombs theory of data given in Chapter Three illuminates. If, as is the case in the present study, the purposes of the factor analysis are clear and a priori meaning structure is being subjected to critical scrutiny, factor analysis can be regarded as a basis for decreasing the extent to which decisions about items are subjective rather than serving to increase the researcher's reliance on subjectivity.

Finally, in response to the suggestion that the 'outputs' of a factor analysis are co-terminous with the 'inputs' to such an analysis, Kline cites Eysenck's factor analytic study of disease symptoms (Eysenck, 1967) which show that if the symptoms of tuberculosis were inserted into a factor analysis together with those of other diseases, a general factor loading on the TB symptoms would emerge, demonstrating clearly a syndrome of covarying symptoms. Kline suggests that 'this factor is not what was put in but is a genuinely new construct' permitting some development in our understanding of a particular symptom-complex.

Though adherents of factor analysis reject these three 'doubts' about the value of the analytic technique, all users of the techniques of factor

analysis need to be mindful of the limitations of the method and of the reliance upon judgement which all research involves.

The objections to factor analysis mentioned above reflect uncertainties about the validity of factor analytic procedures amongst those who do not use factor analysis. There is also a dispute within the factor analysis 'community' as to the most appropriate method of factor analysis for the construction of personality tests.

This disagreement concerns whether or not 'primary' or 'super' factors are the most appropriate level of analysis. In this context, primary factors are those extracted by the factor analysis methods described (briefly) in Chapter Three above, with rotation and superfactors are factored and oblique rotated primaries. In a recent examination of this (sometimes acrimonious*) debate, Eysenck (1978) suggests that 'primary factor analysis without the extraction of higher order factors leaves the analysis incomplete and omits what may be the most important part of the whole procedure' (p.475). He also suggests that the factors which result from primary factor analysis are 'either tautological' factors, ie, are made up of logically related or semantically similar statements of identical content, or else, as in the case of Cattell's 16PF factors, may prove unreliable and often unreplicable (p.475)**.

* See Eysenck, HJ and Eysenck, SBG (1976) : Psychoticism as a dimension of personality. London: Hodder and Stoughton at pages 39 - 44.

** See also Eysenck, HJ (1971): On the choice of personality tests for research and prediction. J. Behav. Science. 1, 85-89 and Eysenck, HJ (1972): Primaries or second order factors. BJ.Soc.Clin.Psychol 11, 265-269.

Arguing that superfactors enable researchers to test hypothesis about personality traits and that primary factors permit traits to be 'discovered' the proponents of the 'superfactor' procedure have tended to dismiss the claims of the 'primary' workers. For their part 'primary' workers (notably Cattell and Guilford) give emphasis to the importance of not stretching the mathematics of factor analysis too far and argue that the search for simple structure is likely to be most readily found by primary methods.

There are two points to note about this debate. First, the debate concerns the method by which factors are extracted and the reliability and validity of these methods. Second, whilst there are these disagreements between workers in the field of factor-analytic personality research, the extent of agreement between such workers is far higher than the extent of their disagreement. Eysenck and Eysenck (1976) state emphatically :

'There are issues on which Cattell, Guilford and we differ, particularly in respect to the value and acceptability of primary factors; this disagreement is sometimes taken to cover wider areas. This clearly is not so; in respect to all the important and substantive matters with which this book is concerned, there is considerable if not perfect agreement.' (p.44).

Since the primary purpose of the factor analysis presented in this Chapter is to examine the validity of the item sub-scale placement, simple structure is thought to be best achieved by means of primary factor analysis (principal axis) with normalised varimax station.*

Test Homogeneity

The first use to which factor analytic techniques have been put in relation to the TDS has been to identify the similarity between the latent structure

* This procedure is recommended in Cronbach, LJ (1970) : Essentials of Psychological Testing. NY : Harper and Row at p.319

of the TDS items and the sub-scale structure suggested by the authors of the scale. That is to say, factor analysis has been used to examine the validity of the item: sub-scale allocations.

Samples and Procedure

500 part-time adult students aged between 22 and 67 (\bar{x} = 31), completed the TDS. The sample consisted of 170 females and 330 males. Scores on each item were dummy coded (telic/not telic) to give interval equivalent properties to the items. The resultant item responses were submitted to a principal components factor analysis with varimax rotation.

Results

Table 5.1 below gives the means and standard deviations for each of the sub-scale for this sample. These data do not appear to differ significantly

	Mean	
SERIOUS	5.77	1.94
PLANNER	5.88	2.24
AROUSAL	6.31	2.52

TABLE 5.1 : Means and standard deviations
for TDS sub-scales (n = 500)

from those reported earlier in this thesis or indeed from those reported below (see Chapter 7, Table 7.1 especially).

Table 5.2 gives the sub-scale inter-correlation for this sample. Once again these data show strong, positive associations between the sub-scale scores. Also present is the weaker association between both AROUSAL and SERIOUS and AROUSAL and PLANNER than is the case with PLANNER and SERIOUS.

	SERIOUS	PLANNER
SERIOUS	1	
PLANNER	.332*	1
AVOIDER	.181*	.282*

TABLE 5.2: Sub-scale inter-correlations for the TDS (n=500).

(* indicates significance at $p < .01$)

The high level of association between these scales suggests that a factor solution should not require an unusually large number of factors to explain the total variance in this data set.

After five iterations, a four factor solution with maximum generalisability of the available factors was produced by the programme*. All factors have a generalisability coefficient greater than .30. Table 5.3 gives the unrotated factor coefficients and communalities for each item, the eigenvalue of each factor and the % of variance 'explained' by each factor.

* The generalisability is determined by means of the formulae:

$$\alpha_p = \frac{n}{n-1} \left(1 - \frac{1}{\lambda_p} \right)$$

See Harman, (1976), at p.231.

Item	Sub-Scale Allocation	Factor 1	Factor 2	Factor 3	Factor 4	Communality 2
T 1	Planner	0.026	-0.064	-0.123	-0.004	0.020
T 2	Planner	0.067	-0.071	-0.054	-0.147	0.034
T 3	Avoider	-0.252	-0.629	0.184	-0.199	0.532
T 4	Planner	0.012	-0.142	0.065	-0.281	0.104
T 5	Avoider	-0.035	-0.272	-0.489	0.204	0.356
T 6	Planner	-0.739	0.304	0.048	-0.048	0.643
T 7	Planner	-0.638	0.076	-0.252	-0.223	0.527
T 8	Planner	-0.599	0.298	0.125	-0.287	0.545
T 9	Avoider	-0.730	0.337	-0.138	0.113	0.678
T10	Planner	0.040	-0.077	-0.411	-0.363	0.308
T11	Avoider	-0.504	0.233	-0.432	0.095	0.504
T12	Avoider	-0.198	-0.733	-0.052	0.014	0.579
T13	Serious	-0.662	0.034	-0.175	-0.046	0.473
T14	Serious	-0.707	0.135	-0.007	-0.170	0.548
T15	Avoider	-0.798	0.229	-0.033	0.163	0.717
T16	Serious	-0.013	-0.153	-0.205	0.110	0.078
T17	Serious	-0.867	-0.375	0.031	0.050	0.897
T18	Avoider	-0.848	-0.379	-0.023	0.122	0.878
T19	Avoider	-0.866	-0.353	0.090	0.015	0.883
T20	Planner	-0.819	-0.253	0.259	0.143	0.823
T21	Avoider	0.196	0.016	-0.387	0.094	0.197
T22	Serious	0.070	-0.002	0.072	-0.187	0.045
T23	Serious	-0.821	0.374	-0.013	0.000	0.814
T24	Serious	-0.824	0.329	-0.052	0.000	0.790
T25	Planner	-0.789	0.366	-0.177	-0.032	0.788
T26	Planner	0.185	0.024	-0.137	-0.406	0.218
T27	Planner	-0.667	-0.409	0.056	-0.036	0.617
T28	Serious	-0.650	-0.366	0.243	0.047	0.618
T29	Serious	-0.174	0.075	0.267	0.282	0.187
T30	Avoider	0.070	-0.225	-0.495	0.079	0.307
T31	Serious	0.060	0.185	0.100	-0.113	0.060
T32	Planner	-0.055	-0.284	-0.039	-0.244	0.144
T33	Serious	-0.082	-0.058	0.061	-0.321	0.117
T34	Avoider	-0.066	0.119	-0.033	0.209	0.063
T35	Avoider	0.058	-0.073	-0.687	-0.013	0.481
T36	Avoider	-0.138	-0.079	-0.192	0.070	0.067
T37	Serious	-0.022	-0.115	0.139	-0.283	0.113
T38	Serious	-0.179	-0.078	0.018	-0.160	0.064
T39	Serious	-0.194	0.064	0.145	-0.163	0.089
T40	Avoider	-0.003	-0.257	-0.475	0.176	0.322
T41	Planner	-0.123	0.040	-0.317	-0.331	0.227
T42	Planner	-0.010	0.031	-0.078	-0.500	0.257
Eigenvalue		9.759	2.943	2.390	1.624	
% variance		58.4	17.6	14.3	9.7	

Table 5.3: Four factors (unrotated) 'solution' for the 42 item
TDS for n = 500

Item	Sub-Scale Allocation	Factor 1	Factor 2	Factor 3	Factor 4
T 1	Planner	-0.023	0.004	0.134	0.036
T 2	Planner	-0.059	0.000	0.045	0.169
T 3	Avoider	-0.058	0.680	-0.011	0.259
T 4	Planner	-0.050	0.111	-0.070	0.290
T 5	Avoider	-0.002	0.112	0.581	-0.079
T 6	Planner	0.769	0.111	-0.183	-0.076
T 7	Planner	0.671	0.152	0.136	0.188
T 8	Planner	0.655	0.056	-0.296	0.157
T 9	Avoider	0.796	0.036	0.010	-0.210
T10	Planner	0.064	-0.101	0.331	0.429
T11	Avoider	0.620	-0.073	0.320	-0.112
T12	Avoider	-0.124	0.685	0.286	0.110
T13	Serious	0.637	0.233	0.115	0.010
T14	Serious	0.698	0.210	-0.101	0.084
T15	Avoider	0.781	0.192	-0.043	-0.260
T16	Serious	-0.021	0.080	0.262	-0.050
T17	Serious	0.589	0.736	0.073	-0.056
T18	Avoider	0.573	0.719	0.139	-0.115
T19	Avoider	0.589	0.731	0.004	-0.034
T20	Planner	0.538	0.685	-0.157	-0.197
T21	Avoider	-0.094	-0.213	0.378	-0.021
T22	Serious	-0.055	-0.023	-0.101	0.177
T23	Serious	0.877	0.078	-0.144	-0.133
T24	Serious	0.869	0.104	-0.093	-0.119
T25	Planner	0.885	0.019	0.004	-0.073
T26	Planner	-0.074	-0.176	0.042	0.424
T27	Serious	0.405	0.669	0.050	0.047
T28	Serious	0.358	0.687	-0.118	-0.068
T29	Serious	0.093	0.119	-0.219	-0.340
T30	Avoider	-0.059	0.013	0.549	0.043
T31	Serious	0.017	-0.160	-0.174	0.066
T32	Planner	-0.033	0.232	0.077	0.289
T33	Serious	0.073	0.082	-0.107	0.306
T34	Avoider	0.089	-0.062	0.032	-0.225
T35	Avoider	0.067	-0.170	0.656	0.132
T36	Avoider	0.121	0.079	0.212	-0.036
T37	Serious	-0.025	0.126	-0.149	0.273
T38	Serious	0.140	0.143	-0.031	0.152
T39	Serious	0.184	0.070	-0.195	0.109
T40	Avoider	-0.024	0.087	0.558	-0.054
T41	Planner	0.232	-0.090	0.206	0.350
T42	Planner	0.098	-0.078	-0.041	0.490

Table 5.4: Factor loadings for varimax rotated factors.

Using the transformation matrix presented on Table 5.4, the varimax rotation of these factor loadings produced the factor loadings given in Table 5.5. It is this last table which provides the basis for subsequent analysis and discussion.

	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	-.875	-.476	.039	.081
Factor 2	.418	-.826	-.332	-.181
Factor 3	-.214	.293	-.920	-.148
Factor 4	-.119	.070	.205	-.969

TABLE 5.5 : Transformation matrix for varimax rotation of four factors given in Table 5.3

Factor One

The first factor in Table 5.5 is a generalised factor with the significant positive loadings (ie, factor loading 5% of the factor variance) on items 6, 7, 9, 14, 15, 23, 24 and 25. These items are :

- 6 Work that earns promotion
- 7 Planning your leisure
- 9 Planning your tasks set for you
- 14 Work activities
- 15 Taking holidays always in the same place
- 23 Refereeing a game
- 24 Eating special things because they are good for your health
- 25 Fixing long term life ambitions

Whilst these items appear generally concerned with planning and work (especially items 6, 7, 9, 14, 25) there are elements of both arousal avoidance (implicit in items 7, 15, 25 and explicit in 9) and serious-mindedness (implicit in all items except 15) in this factor. For this reason, this is regarded as a generalised telic factor. As such, it accounts for 58.4% of the variance in the dummy coded data.

Factor Two

Factor 2, which accounts for 16.8% of the variance in the dummy coded data, has significant positive loadings on eight items, none of which are significantly loaded on Factor 1. These items are :

- 3 Leisure activities which have a purpose
- 12 Seldom doing things for kicks
- 17 Taking life too seriously
- 18 Always eating familiar foods
- 19 Recounting an incident accurately
- 20 Spending £100 repaying a loan
- 27 Having purposes for your behaviour
- 28 Climbing a mountain to save someone

Originally, four of these items (3, 12, 18 and 19) were allocated to the AROUSAL sub-scales. Items 27 and 20 were allocated to PLANNER and items 17 and 28 to SERIOUS. There does appear to be some reason to question some of these allocations. For example, item 17 poses the choice between 'Taking life seriously' or 'Treating life light-heartedly'. Whilst the telic choice here is clearly SERIOUS (it includes 'seriously' in its phrasing)

the paratelic choice may be regarded as being both not-serious and 'fun-seeking' - 'light-hearted' being equated here with 'fun'. Indeed, Roget's thesaurus categorise 'light-hearted' with 'animation' and 'exhilaration' rather than with words like 'playful' or 'amusement'. It may well be that S's opted for the telic choice to reflect arousal avoidance rather than to commit themselves to seriousmindedness. Similar comments can also be applied to items 20 and 27. For these reasons, this factor may be regarded as an arousal avoidance factor.

Factor Three

Factor 3 is also dominated by significant positive loadings on arousal avoidance items (11, 12, 18, 21, 30, 35, 36 and 40) and, unlike Factor 2, there are negative loadings on serious and planner items (6, 8, 20, 23, 28, 29, 31, 37 and 39). In addition, there are significant positive loadings on 'planner' items 1, 7, 10 and 41 and on 'serious' items 13 and 16. This factor is the first truly bi-polar factor produced in this analysis and for this reason deserves particularly close scrutiny.

In all, fifteen items are positively and significantly loaded on Factor

3. These items are :

- 1 Compile a short dictionary for financial reward
- 5 Spending ones life in one place
- 7 Planning your leisure
- 10 Investing money in a long term insurance/pension scheme
- 11 Staying in one job
- 12 Seldom doing things for kicks
- 13 Going to a meeting
- 16 Given two weeks of free time, finishing a needed improvement at home

- 18 Always eating familiar foods
- 21 Having continuity in the place that you live
- 30 Going through life safely
- 35 Steady routine in life
- 36 Working in the garden
- 40 Working in one office or workshop
- 41 Planning ahead

- they have in common a concern with planned security - what others might call 'stability in life' and as such these items constitute a dominant telic factor, subsuming the three sub-scales described in Chapter Four.

The nine significant, negative loadings on this factor may best be explored by means of looking at the paratelic option. These nine paratelic options are :

- 6 Work that you enjoy doing
- 8 Watching TV for entertainment
- 20 Spending £100 on an enjoyable weekend
- 28 Climbing a mountain for pleasure
- 29 Happy to waste time
- 31 Watching an exhibition game with star performers
- 37 Reading for fun
- 39 Playing a game for fun

They appear to have in common the idea of relaxation and leisure, suggesting that this factor may be regarded as a PLANNED SECURITY/RELAXATION factor - a factor similar to Comrey's (1970) factor of 'orderliness'. The bi-polarity

of the factor is perhaps best captured in terms of stability/security vs purposive striving, and the listing of the telic choices for the nine significant and negative loaded items given below make clear that purposive striving is very much a dominant characteristic of these items :

- 6 Work that earns promotion
- 8 Going to a formal evening meeting
- 20 Spending £100 on repaying a loan
- 28 Climbing a mountain to save someone
- 29 Always having to be busy
- 31 Watching a crucial match between two adversary sides
- 37 Reading for information
- 39 Winning a game

Though this third factor accounts for less than 15% of the variance in these data, the structure of this factor poses problems for the nature of the TDS. These problems will be discussed in detail below.

Factor Four

The first factor that from this analysis contains eight positive and significantly loaded items, six of which (4, 10, 26, 32, 41 and 42) were regarded as PLANNER items at the time of test construction. The two remaining items (29 and 33) were originally allocated to the SERIOUS sub-scale. These eight items are :

- 4 Improving a sporting skill through systematic practice
- 10 Investing money in a long term insurance/pension scheme
- 26 Always trying to finish your work before you enjoy yourself
- 29 Always having to be busy
- 32 Organising a game
- 33 Reading a biography
- 41 Planing ahead
- 42 Planning a holiday

They seem to have in common 'purposiveness' - activities referred to in these items are intended to serve some purpose, hence the use of words like 'improving', 'long-term', 'organising' and 'planning'. Whilst the term PLANNER may be seen as appropriate to these items, the term 'purposive' seems now to be a more accurate reflection of the item-content of this factor.

Some 'Problems'

These data and their interpretation present two difficulties which are relevant to the question of the validity of the TDS. These two difficulties are (a) that there is a slight overlap between factors two and three and between factors three and four; (b) more seriously, the factor structure produced by these procedures do not, at first sight, appear to conform to the sub-scale structure adopted at the time of test construction.

The first of these difficulties is not as pronounced as might be expected. In fact, only two items are loaded in the same direction on both the second and third factors (items 12 and 18) and a further two items overlap on factors three and four (items 10 and 41). It would appear

that factors two and four are 'finer' factors than factor three, as the examination of the item-content domains of these factors has suggested.

The broadness of factor three makes inevitable some small measure of overlap between factors two and three and three and four. Interestingly, there are no overlaps between factors two and four, giving encouragement to our view that factor three is broader than the finer factors two and four.

The second difficulty is far more significant for the construction and validity of the TDS than that examined in the previous paragraph. It concerns the sub-structure of the TDS itself. In developing this scale, three sub-scales were proposed. These were arousal avoidance, seriousmindedness and planning orientation. In addition, it was assumed that all items would have a place in the structure of the scale and that the combination of these scales would produce a general 'telic-factor'. The factor analysis produces a principal axis which was labelled a general factor and which accounts for 56% of the variance. The second factor extracted here is also regarded as an arousal avoidance factor, though this involves some re-interpretation of items. The third factor, notably the only truly bi-polar factor to emerge from this study, has been labelled here 'stability/security vs purposive striving' and amounts for 14.3% of the variance of these data. This factor would not appear to fit easily into the definition of serious-mindedness offered in Chapter Two. Yet, it may well be that the 'goals to which an individual is orientated' and which he 'regards as essential' involve the primary goal of security or stability in life. Indeed, Maslow's need hierarchy (Maslow, 1954) would suggest that the search for security is a major motivational feature of human beings. This is not to say that this factor can be directly equated with the seriousmindedness construct, but it does not appear to be unduly divorced from it. Much more important,

the item allocations for the various sub-scales made at the time of test construction do not work well in the context of this factor. Finally, the fourth factor, accounting for almost 10% of the variance in these data would appear to equate well with the construct of planning orientation used at the time of construction, though the term 'purposive' would seem now to be a more appropriate description of the items in this field.

Conclusion

Though the factor analysis gives general support to the existence of arousal avoidance and planning orientation factors, seriousmindedness would appear to be subsumed in a broader, coarser bi-polar factor labelled here as 'stability/security vs purposive striving'. This seems to suggest the need to examine in some depth the phenomenological basis of individual responses to these items and to retain a vigilance about the factor structure of this measuring device.

CHAPTER SIX

VALIDITY STUDIES OF THE TELIC DOMINANCE SCALE

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Introduction

In the previous chapters, studies of the internal consistency, item, scale and test reliability were reported in order that the reliability of the Telic Dominance Scale (TDS) could be examined. It was demonstrated that, though some items were 'unstable', the TDS showed a high degree of test-retest reliability over a number of different periods of elapsed time up to and including twelve months. It was also shown that the TDS possessed satisfactory levels of internal consistency despite the 'poor' discrimination of some items. In this Chapter, the research on the validity of the TDS is examined using some of the techniques described in Chapter Three.

A number of the validation studies are reported in Murgatroyd, Rushton, Apter and Ray, (1978) and these are re-examined here.

Studies by Apter

Apter used the WHO AM I TEST (Kuhn and McPartland, 1954) to examine the extent to which global self-descriptions offered by a number of respondents could be related to the total score obtained by means of the TDS. The WHO AM I TEST asks respondents to complete as many sentences as possible about themselves in a fixed time interval. The responses of 51 undergraduate students of psychology were examined by three judges independently and rated for the degree of telic dominance displayed. For example, statements like 'I am serious' or 'I am deeply concerned about my future' or 'I am usually careful about what I write on questionnaires in case it offends' were seen to be more telic responsive than 'I am exciting' or 'I am really keen on sex' or 'I am bored by this survey' which were regarded

as being more paratelic. Using a five point scale, each respondent was given a single telic rating. The inter-judge reliability was high ($r = .879$, $p < .05$), indicating that the judges tended to agree on the ratings that should be given to the respondents on the basis of all their 'WHO AM I' responses. The correlation between the total score of the TDS and the rating was calculated using a Pearson product moment correlation coefficient and was found to be .30 which is statistically significant at the 5% level. Whilst this is only just satisfactory, it does illustrate that the TDS scores can be related to the impressions created when statements made by respondents are analysed in the manner indicated above.

This WHO AM I STUDY, however, tends to confuse traits and states. For the responses given by individuals were essentially of two kinds. On the one hand, respondents made statements about how they usually feel ('I am usually careful about what I write on questionnaires in case it offends', for example) whilst on the other, they wrote statements indicating their current feelings ('I am bored', for example). The judges therefore had to balance the impressions given by the normative statements with those related directly to the state of the respondent. It may well be that the balance between these two features, though commonly understood by the judges as indicated by the high inter-judge reliability coefficient, tended to weaken the theoretical significance of the study.

Apter's second study sought to overcome some of these problems by requiring respondents to focus only upon their current state and excluded reference to the way they usually felt. 14 subjects, all full time undergraduate students, rated themselves on two dimensions at hourly intervals each afternoon for a week. The first dimension required subjects to record the extent to which they wished to pursue something serious as opposed to something playful.

The second dimension required subjects to rate the extent to which they were seeking relaxation rather than excitement. Mean scores for each individual on each of these two dimensions were obtained and ranked and the resultant rankings correlated with ranked scores on the SERIOUS and AROUSAL sub-scales of the TDS. The hypotheses being tested was that the first rating scale would be positively correlated with the SERIOUS sub-scale whilst the second sub-scale would be positively correlated with the AROUSAL sub-scale and that both correlations would be statistically significant at $p < .05$. For the 'serious' measures, the ratings and the SERIOUS scores failed to correlate at an acceptable level of statistical significance ($r = .345$), though it is important to note that the 5% significance level was almost reached by these data. For the relaxation/excitement measures, the correlation between the ratings and the AROUSAL sub-scales was significant at the 1% level ($r = .662$), indicating that the arousal avoidance sub-scale and the ratings of state was correlated with feeling the need for relaxation rather than excitement. Both correlations were in the (anticipated), positive direction.

Neither the WHO AM I test nor the state measures in everyday life data produce entirely satisfactory results. For whilst the trend of the data reveals an association between the criterion and the TDS in both studies, the criterion measure in the WHO AM I study is weak for the reasons indicated above and the 'state measures' study produces inconclusive data for the SERIOUS sub-scales. Whilst some confirmation of the criterion-related validity of the AROUSAL sub-scale might be inferred from Apter's second study, the first is too weak to permit conclusion. The need for further work is clearly indicated.

Studies by Ray

A study by Ray* offers some experimental evidence for the construct validity of the TDS. Sixty undergraduate students of psychology completed a version of Stroops colour-word-interference task (Stroop, 1935) in which ten unpleasant and emotive words (eg, slime, stench, cancer) and ten words rated as neutral to the emotive words were colour presented. Following the presentation of the colour coded words, subjects were asked to write down recollected words from memory. A hypotheses being tested in this study was that the more paratelic the individual the greater would be his/her sensitisation to emotional words. This would be so for two reasons. First, the paratelic dominated would not be concerned about indicating that he/she had recollected emotionally loaded words at the expense of neutral words; second, the more emotional words would create a higher level of arousal than the neutral words which would be felt as pleasant by the paratelic dominated and unpleasant by the telic dominated.**

The data collected by Ray indicated that the less telic dominated individual remembered significantly more emotional words than those who were highly telic, as indicated by the statistically significant negative correlation between emotional words recollected and their total scores on the TDS ($r = -.320$ $p < .05$). Also, a statistically significant correlation ($p < .05$) was observed between subject's total score on the TDS and the discrepancy between the number of emotional words recalled and the number of neutral words recalled ($r = .37$). Since the discrepancy of all subjects was in the direction of more unpleasant than neutral words, it can be said that subjects

* Reported in Murgatroyd, Rushton,

Apter and Ray (1978)

** See Smith and Apter (1975) at page 3, esp. from (d)

tended to be sensitised in this experiment rather than being defensive. Subjects showing low telic dominance were significantly more sensitised to the words than subjects scoring high on the TDS. This is consistent with reversal theory since paratelic dominant subjects would be expected to be more sensitised to words which produce arousal than would telic dominated subjects because of paratelic feature of the personality encourages arousal-seeking.

The same pattern of results emerged when the same subjects were asked to pick out words presented in the experimental task from a list of unfamiliar words, ie, when subjects were tested in terms of recognitions rather than recall. The product moment correlation between the number of unpleasant words recognised and the TDS score was $-.24$, which is statistically significant at $p < .05$, and the product moment correlation between TDS total scores and the discrepancy between unpleasant and neutral words was $-.27$, which is also significant at $p < .05$.

It is suggested that this study provides some evidence for the construct validity of the TDS since subjects who obtained low scores on the TDS displayed behaviours which would be predicted from the theoretical models which underpin the test.

Ray's study, apart from providing the only experimentally obtained data in the Murgatroyd et al (1978) paper, provides limited evidence for the construct validity of the TDS. It might be thought that the personality feature measured by the AROUSAL sub-scale would be the most significant contributory factor to sensitisation, the experimental design having only indirect relevance to the features measured by the SERIOUS and PLANNER sub-scales. That this sub-scale did not correlate with the discrepancy scores may

well reveal either a weakness in the construction of the AROUSAL sub-scale or specific effects due to the design of the experiment which made the configuration of the sub-scales a better indicator of sensitisation than the one theoretically relevant sub-scales. Once again, the need for further work on the construct validity of the TDS is indicated by these data.

Studies by Murgatroyd

Two studies by Murgatroyd* provide further evidence which can be considered in relation to construct validity.

The first of these studies examines the relationship between telic dominance and need for achievement (NACH), where the latter is measured by means of the questionnaire measure of NACH developed by Robinson (1961)**, and later used by Argyle and Robinson (1967). This NACH measure provides two specific measures - hope of success and fear of failure. It was hypothesised that the more telic the individual the greater would be his fear of failure whilst the more paratelic the individual, the greater would be the hope of success. That is to say, there would be a statistically significant positive correlation between the three sub-scales of the TDS and scores on the 'fear of failure' measure and a statistically significant negative correlation between hope of success and the three sub-scale scores included in the TDS. In part these hypotheses were advanced following Smith and Apter's (1975) comments on thinking in the telic and paratelic (see pages 6 - 8) and in part due to the observation that since goals are of less importance to the paratelic

* Reported in Murgatroyd, Rushton, Ray and Apter (1978).

** Reproduced in Cohen, L (1977): Educational Research in Classrooms and schools. London: Harper and Row.

dominated individual, his hope of success is not related to specific goals but to general achievements whereas for the telic dominated individual, the fear of failure is likely to be high since goals are specific and failure is therefore more readily gauged.

Table 6.1 below offers a summary of the data collected in this study.

	Serious mindedness	Planning Orientation	Arousal Avoidance
Hope of success	-.275	-.288	-.272
Fear of failure	.263	.277	.271

TABLE 6.1 Correlations between Robinson's NACh measure and the TDS (n = 112)

The data presented in Table 6.1 indicate that persons who may be regarded as having a low degree of telic dominance (ie, are highly paratelic) have a high hope of success, as indicated by the negative correlations.

In the final validity study reported in Murgatroyd et al, 112 first year part time undergraduate students of the Open University completed the short, 12 item version of Eysenck's extraversion/neuroticism measure (Eysenck, 1958) together with the TDS. The purpose of this study was to demonstrate that the TDS did not measure extraversion or neuroticism. Table 6.2 below, provides the inter-scale correlations and these correlations all fail to reach significance, which demonstrates that the TDS does not measure either extraversion or neuroticism.

	Extraversion	Neuroticism
Seriousmindedness	.061	.070
Planning Orientation	.077	.044
Arousal Avoidance	.049	-.045

TABLE 6.2 Intercorrelation between the TDS and the shortened version of the EPI (n = 112)

Since the completion of the paper by Murgatroyd et al in 1977 and following from its publication in 1978, a number of other studies have been completed. These are examined in detail below.

Studies by Svebak

Sven Svebak, working at the University of Bergen in Norway, has used the TDS in studies of humour, where humour is examined in terms of laughter rates, sense of humour, mirthfulness and a capacity for being funny as measured by Svebak's own questionnaire, (unpublished). In the pursuit of his interests in humour, he has also made use of the EPI and so intertest validity may be examined as well as the construct validity of the test.

In reporting this data¹ a word of caution is needed. The TDS being used by Svebak is not the English version of the scale but is a version which he has developed by translating the English version into Norwegian. Because it cannot be assumed that translation leads to a comparable scale, these data must be seen as problematic for two reasons. First, the Norwegian

¹

At the time of writing, these data have not been published and are taken from personal correspondence with Svebak.

Telic Dominance Scale (NTDS), like its French counterpart (FTDS)* is not founded upon any validity or reliability data. For this reason, data from the NTDS must be regarded as 'weak'. Secondly, the humour measures from Svebak's research are themselves in development and validity studies of the procedures used are still under way. These cautions suggest that, at best, Svebak's data should confirm the general direction of findings from research using the TDS and that his data should produce results which are consistent with what might be hypothesised from the theory of humour derived for reversals theory (See Smith and Apter, 1977, and Apter, 1979).

In all, Svebak completed three studies involving the TDS between March 1978 and March 1979.

Study One

In the first study, 20 subjects completed the Svebak Humour Questionnaire (SHQ) and the Norwegian Telic Dominance Scale. The resultant data was correlated and the Pearson product-moment correlations are given in Table 6.3 below.

NTDS SCORES	Svebak Humour Questionnaire Scores		
	Mirthfulness	Sense of Humour	Capacity for being funny
SERIOUS	-.10	.15	.06
PLANNER	-.72*	-.19	-.25
AVOIDER	-.10	.15	.06

TABLE 6.3: Correlations between TDS sub-scale scores and scores on the Svebak Humour Questionnaire (*indicates p.001, df = 19 two-tailed test).

* Developed by Robert Hoogstraad at the University of Louvain, Belgium.

As is clear from this table, mirthfulness is negatively correlated with PLANNER at the highly significant level of $p < .001$. In addition, mirthfulness is negatively related to all other TDS sub-scales and PLANNER is negatively related to all sub-scales of the Svebak Questionnaire.

Svebak infers that paratelic dominance, especially in relation to PLANNER, in part determines the extent to which a person possesses a capacity for mirthfulness: those who are more likely to act impulsively are also more likely to be mirthful. Since Apter and Smith (1977, p.97) have presented a model of the humour process which gives emphasis to the experience of humour in a paratelic state, Svebak's data would appear to confirm that this feature of the telic personality contributes significantly to a persons potential mirthfulness.

Study Two

In the second study, 33 undergraduate students acted as subjects (15 males and 18 females) and completed the Eysenck Personality Inventory (EPI). In addition, the frequency with which they smiled (SMILE) and the frequency of their laughter (LAF) during the presentation of filmed, humorous materials was counted by observers. This design permits two validity questions to be asked about the NTDS: (a) does the data appear consistent with the hypothesis that telic dominance will be negatively related to measures of humour capacity and sense of humour (the construct validity question) and (b) does the data show that the EPI and the NTDS measure different personality characteristics (the intertest validity question)?

Table 6.4 presents the questionnaire data relevant to the construct validity question. Though all but one of these Pearson product-moment correlation coefficients are in the direction predicted (the more paratelic the more humorous), none of these correlations are statistically significant. Whilst the trend of these data is in the direction hypothesised, the trend is not so strong as to provide direct association with the TDS measure.

NTDS Scales		SHQ Scales		
		Mirthfulness	Sense of Humour	Capacity for being funny
SERIOUS	33	-.79	-.289	-.156
PLANNER	33	-.299	-.106	-.114
AVOIDER	33	.020	-.303	-.172

TABLE 6.4 Pearson product: moment correlations between the NTDS and the SHQ (n = 33)

In many ways this is to be expected, for the theory of humour developed by Smith and Apter gives emphasis to context and states facilitators of humour and does not advance a trait theory of humour.

Table 6.5 presents data which directly concern the question of intertest validity, and these data do appear to pose a serious problem for the validity of the NTDS. For extraversion is negatively related to SERIOUS and AVOIDER ($p < .05$) suggesting that the extravert profile and the paratelic profile may be closely related. There is, however, no statistically significant association between neuroticism and the NTDS sub-scale detected for these data.

NTDS Scales		EPI	
		Extraversion	Neuroticism
SERIOUS	33	-.399*	.149
PLANNER	33	-.304	.092
AVOIDER	33	-.409*	.232

TABLE 6.5: Product-moment correlations between the NTDS and the RPI (n=33) (* indicates $p < .05$, one tailed)

These effects may be due to a variety of factors, notably those associated with small sample sizes. Additionally, the translation of the TDS into Norwegian may have brought the extravert and paratelic profiles closer to each other. Since the data contrasts with that presented in Table 6.2, it does give rise for intertest validity concern.

Study Three

The third study directed by Svebak replicates his first with a large sample size. In all, 105 students enrolled on first year courses at the University of Bergen completed the SHQ and the NTDS. The resultant data were examined using Pearson product-moment correlations between the sub-scales of the two instruments and the correlation matrix is given as Table 6.6 below.

Interestingly, the correlation matrix is very similar in its structure to the matrix presented as Table 6.3 for the PLANNER sub-scale of the NTDS correlates significantly ($p < .01$) with mirthfulness as it did in Table 6.3 and also acts as a predictor of 'capacity for being funny' as it almost did at Table 6.6. But there are some differences between Tables 6.3 and 6.6 which are worth noting. First, all the correlation coefficients in Table 6.6 are

NTDS Scales		SHQ Scales		
		Mirthfulness	Sense of Humour	Capacity for Being Funny
SERIOUS	105	-.131	-.199*	-.074
PLANNER	105	-.277**	-.143	-.262**
AVOIDER	105	-.012	-.134	-.165

TABLE 6.6: Product-moment correlations between the NTDS and the SHQ (n = 105) (* indicates $p < .05$, ** indicates $p < .01$).

negative indicating that the three humour measures are generally associated with paratelic rather than telic dominance, as might be expected from the description of the paratelic state given in Chapter One. Second, the SERIOUS sub-scale of the NTDS is here negatively and significantly ($p < .05$) associated with the Sense of Humour scale of the SHQ, suggesting that the less serious a person is the greater their sense of humour, which also gives support to the construct from which this scale is derived.

As with all these studies by Svebak, the absence of reliability data and of any variety of validity data should serve to caution the interpretation of the Tables produced as Table 6.3 to Table 6.6 above, especially given the relationship between extraversion and the SERIOUS and AVOIDER sub-scales of the NTDS reported above. In particular, caution does need to be exercised by those who wish to relate these findings back to the English version of the TDS. For whilst the relationships between the SHQ and the NTDS follow a pattern which is generally commensurate with that hypothesised in reversal theory, it is not clear how the NTDS and the TDS differ and the extent to which inter-correlations between the NTDS and any other instrument (especially the EPI) may be due to translation differences. Nonetheless, these data are

of interest and concern and give an indication of one important area for further research, namely the relationship between the TDS and the EPI.

Subsequent Studies

From these initial studies, Svebak has undertaken several extreme group experiments together with co-workers at the University of Bergen. In Svebak, Dalen and Storfjell (1981), these co-workers explored the value of Malmo's assertion of an autonomic gradient and concluded that some other model of the relationship between autonomic and somatic arousal is needed if the complexity of the relationship between psychological and physiological variables is to be understood.

A subsequent paper by these same co-workers (Svebak, Storfjell and Dalen, 1982) sought to expose subjects in a laboratory condition to such aversive conditions so as to induce the telic state. When in this state, subjects completing a sensory motor task showed higher levels of muscle tension in the forearm flexors and higher heart rates than when not in this state.

Svebak (1982) and Svebak and Murgatroyd (inpress) document further data from studies of extreme groups selected by means of the TDS completing laboratory tasks. Significant differences do appear to exist in the physiological responses of the two groups as will be seen from the paper reproduced here as Appendix Four. These differences relate to neurophysiological activity, heart rate, respiratory activity and muscle tension. Work is in progress in identifying biochemical differences between extreme telic and paratelic groups so as to complete a study of the psychophysiology of these different forms of dominance. All of these data are strongly supportive of the construct validity of the TDS and may yet justify the early enthusiasm for

reversal theory shown by Svebak and Stoyva (1980).

Studies by Walters

Jean Walters, when working at the University College, Cardiff, has studied the relationship between Telic Dominance as measured by the TDS and depression as measured by the Leeds Scales for the Self-Assessment of Anxiety and Depression (Snaith et al, 1976). The hypotheses to be tested, derived from the theory of reversals, was that there would be no statistically significant relationship ($p < .01$) between the TDS and the three measures of depression afforded by the Leeds Scale. This hypotheses essentially constitute an attempt to establish what was referred to in Chapter Three as 'discriminant validity' (Campbell, 1959). That is to say, to establish that the TDS does not measure in the same content domain as the Leeds Scales.

The hypothesis advanced by Walters was that there would not be any statistically significant relationship between the TDS and the three measures of depression implicit in the Leeds Scale. These three measures are (a) a measure of endogenous depression (a trait measure); (b) a measure of reactive depressive symptoms and (c) a measure of depression-proneness.

Table 6.7 below gives the product-moment correlations between these three measures of depression and the three TDS sub-scales. Because of the sample size, Walters set the confidence limit for these correlations at $p < .01$. If the confidence limit had been set at $p < .05$ the correlations between the SERIOUS and the scale measuring endogenous depression would have been significant. Walters, not wishing to make a type two error, decided that the probability level she set was one in which error-risks were minimised.

		Endog.Depress.	Reactive Depress.	Dep.Proneness
SERIOUS	25	-.401	-.297	-.277
PLANNER	25	-.297	.039	-.241
AVOIDER	25	.201	.204	.188

TABLE 6.7: Product-moment correlation coefficients between the three depression sub-scales of the Leeds Scale of the TDS (n=25)¹

One other feature of this study gives rise for some concern. The TDS sub-scale intercorrelations are weak, as the data in Table 6.8 demonstrate. These data support the view, stated earlier, that the AROUSAL sub-scale demonstrates a marked degree of independence from the SERIOUS and PLANNER sub-scales and perhaps, for these subjects at least, ought to be regarded as a dimension independent of both SERIOUS and PLANNER sub-scales. The work conducted by Walters and reported here is, like that of Svebak, a preliminary study which uses a small sample of only 25. Though the effects noted above may be due entirely to sampling factors, this work again highlights this feature of the TDS which has proved to be problematic in some of the other studies cited above.

	SERIOUS	PLANNER	AVOIDER
SERIOUS	1		
PLANNER	.503*	1	
AVOIDER	.042	.116	1

TABLE 6.8: Sub-scale intercorrelations for the Telic Dominance Scale (n = 25)¹

¹ Personal correspondence 1.2.78

Studies by Aris and Murgatroyd

A construct validity study has recently been completed by Murgatroyd and Aris (1978)¹. It was hypothesised that there would be a statistically significant negative correlation between the variety of sexual practices engaged in by S's and their scores on each sub-scale of the TDS (at $p < .01$). In this study, a checklist of sexual behaviours (derived from that of Eysenck)² was used to determine the variety of sexual practices engaged in by an individual (see Figure One): the higher the score on this self-report inventory the more varied the sexual practices of the individual. A second hypotheses, related to the first, was that an individual's exposure to 'pornographic' material would be a function of their scores on the TDS: the more varied their experience of pornography the lower the TDS scores. A self-report inventory (Figure Two) was used to determine the variety of S's experience of pornography - the higher the score the more varied their experience of pornography.

The subjects for this study were fifteen male and fifteen female full-time undergraduate students. The mean age of this sample was 23 years (range 19 - 31). Table 6.9 gives the mean sub-scale scores and standard deviations for this group; also shown are the mean score and standard deviations on both the sexual behaviour and pornographic variety inventories.

¹ 'Sexual arousal: some data consistent with reversal theory' (unpublished)

² Eysenck, HJ (1972) : Psychology is About People, London: Allan Lane, p.78.

Sub-scale	All S's (n = 30) Mean (d)	Males (n = 15) Mean (d)	Females (n = 15) Mean (d)
SERIOUS	5.65 (2.5)	6.23 (1.78)	5.73 (2.5)
PLANNER	5.08 (2.3)	4.77 (2.3)	5.4 (2.3)
AVOIDER	4.73 (2.2)	4.93 (2.3)	5 (2.1)
Sex Behvr.	12.04 (4.7)	12.6 (4.4)	12.93 (4.3)
Porn. Variety	5.27 (3.1)	5.73 (3.2)	5.5 (3.0)

TABLE 6.9 : Means and Standard Deviations for TDS sub-scales and the Sexual Behaviour and Pornographic variety Inventories

It will be noted that there are no significant differences between males and females on any of the variables for which data is available. This is particularly interesting in relation to sexual behaviour. For as Eysenck (1972)¹ has shown, there have been observed differences between the sexes in response patterns to this inventory.

¹ Eysenck, HJ (1972): Psychology is About People. London: Allan Lane, p.78.

INVENTORY OF SEXUAL BEHAVIOUR

Here are brief descriptions of sexual behaviour patterns which people indulge in. Indicate by putting a cross (x) in Column 1 whether you have ever experienced or indulged in this type of behaviour.

(Note: manual = by hand; oral = by mouth)

COLUMN 1	
	1. One minute continuous lip kissing.
	2. Manual manipulation of male genitals, over clothes by females
	3. Kissing nipples of female breasts
	4. Oral manipulation of female genitals
	5. Sexual intercourse, face to face
	6. Manual manipulation of female breast, over clothes
	7. Oral manipulation of male genitals, by female
	8. Manual manipulation of male genitals to ejaculation by female
	9. Manual manipulation of female breasts, under clothes
	10. Manual manipulation of male genitals, under clothes, by females
	11. Sexual intercourse, man behind woman
	12. Manual manipulation of female genitals, over clothes
	13. Manual manipulation of female genitals to massive secretions
	14. Mutual oral manipulation of genitals to mutual orgasm
	15. Manual manipulation of female genitals, over clothes
	16. Mutual manipulation of genitals
	17. Oral manipulation of genitals to ejaculation, by female
	18. Mutual manipulation of the genitals to mutual orgasm
	19. Mutual oral-genital manipulation

Figure One: Inventory of Sexual Behaviour

PICTURE HISTORY INVENTORY

During the last six months, have you seen photographs in books, magazines or postcards depicting the following (✓ if YES)

Tick Here

- () 1. Partially clothed female - genitals covered
- () 2. Unclothed female - genitals exposed
- () 3. Unclothed female engaged in masturbation
- () 4. Unclothed male and female engaged in foreplay
- () 5. Oral manipulation of male genitals by female
- () 6. Oral manipulation of female genitals by male
- () 7. Intercourse, man and woman facing
- () 8. Intercourse, man behind woman
- () 9. Group sex where the pictures have included oral manipulation of male and female and intercourse
- () 10. Female domination of male by force
- () 11. Female:Female mutual manipulation of genitals
- () 12. Male:Male mutual manipulation of genitals
- () 13. Penetration of female genitals by an object other than the male genital
- () 14. The use of animals for sexual purposes

Figure Two : Pornographic Variety Inventory

Table 6.10 gives the sub-scale inter-correlations for these subjects, which shows that the sub-scales are closely inter-related ($p < .001$) as has been the case with the majority of the studies reported in this thesis,

	SERIOUS	PLANNER	AVOIDER
SERIOUS	1		
PLANNER	.751	1	
AVOIDER	.502	.680	1

TABLE 6.10 : Sub-scale Intercorrelations ($n = 30$), Aris and Murgatroyd, 1978

with the notable exception of Walters above.

Table 6.11 gives the inter-correlations between the three sub-scales and the scores of S8s on both the Sexual Behaviour Inventory ('SEXY') and the Pornographic Variety Inventory ('PORNO'). As can be seen, all correlations are significant at $p < .001$ when a one tailed test is applied. Thus the

	'SEXY'	'PORNO'
SERIOUS	- .538	- .634
PLANNER	- .742	- .620
AVOIDER	- .833	- .588

TABLE 6.11 : Inter-Correlations Between Sexual Behaviour and Pornographic Variety Scores of Individuals and their TDS scores ($n = 30$). All correlations $p < .001$.

correlations confirm the hypotheses advanced earlier. It should be noted that the most significant correlation of those reported here is that between sexual behaviour and arousal avoidance, suggesting that the more varied the sexual practices of the individual the more likely it is that they seek out arousal rather than avoid it. This finding is as predicted from reversal theory and gives some evidence of the validity of this scale in particular.

Using these same subjects, Aris and Murgatroyd conducted an experimental construct validity study of the TDS. On the basis of their standardised total TDS scores, S8s were classified as telic (if Z scores ≥ 1), paratelic (if Z ≥ 1) or as norm reference subjects (if Z $< .99$ or $> -.99$) and then exposed to arousing stimulus materials and asked to record their phenomenological states in terms of arousal and hedonic tone. It was hypothesised that the relationship between self-ratings on these two dimensions (arousal and hedonic tone) would differ significantly between the three experimental groups. From reversals theory, telic subjects should find high levels of arousal unpleasant and paratelic subjects find high levels of arousal pleasant. The norm-reference group should show an equivalent response pattern for both dimensions over time. The procedures used and the results are described fully below.

Apparatus and Test Materials

The materials used in this study were (a) the Telic Dominance Scale (Murgatroyd et al, 1978); (b) a Sexual Behaviour Index (SBI) derived from that of Eysenck (1972); (c) a Pornography Variety Index (PHI), also derived from Eysenck; (d) 40 photographs (frames) deemed to be pornographic by a number of judges; (e) two self-rating scales and (f) a stopwatch. The Sexual Behaviour Inventory, the Pornography Variety Index are given as

Figure One and Two above and the two self-rating scales are given below as Figures Three and Four.

The photographic material included in this study was of equal size and was categorised in the following way :

Category One: these photographs depicted females in provocative poses, which did not involve the exposure of either breasts or genitals.

Category Two : these photographs depicted females partially clothed with breasts exposed and genitals not exposed

Category Three : these photographs were of nude females with genitals clearly exposed, sometimes by the holding open of the labial lips

Category Four : these photographs showed women in explicit masturbation poses with either their own fingers or objects inserted into the vagina

Category Five : these photographs were of oral sex consisting of either females performing fallatio or males performing cunnilingus on a partner of the opposite sex

Category Six : in this category, photographs of homosexual or lesbian acts were presented

Category Seven : photographs of the penis in the vagina were presented in this category

Mark below by placing an (X) at the point which most reflects your feelings right now

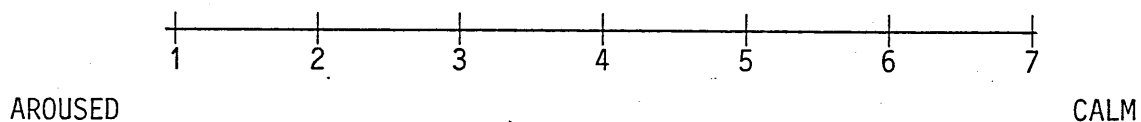


Figure 3 : Self-Rating Scale 1 (arousal)

Mark below by placing an (X) at the point which most reflects your feelings right now

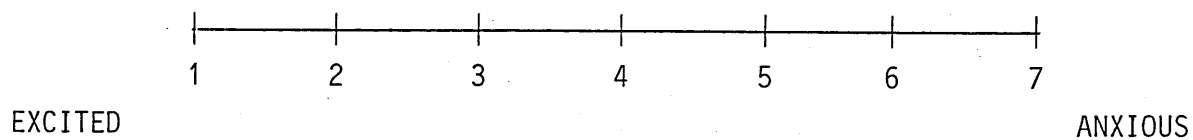


Figure 4 : Self-Rating Scale 2 (hedonic tone)

Category Eight: in the final category, pictures showing group sexual practice (essentially intercourse and oral sex) were presented.

These categorisations are similar to those used by Abelson, Cohen, Heaton and Suder (1978) and Wilson and Abelson (1973) in a study of response sets to pornographic material.

An attempt was made to control the variety of photographs (frames) within each category. Twelve judges, similar in age to the subjects, were asked to rate each frame on a five point explicit-provocative dimension. The modal position of each frame in each category was ascertained. One picture from each point of the five point scale was chosen to constitute each category thus giving a final picture set of forty frames.

In addition to controlling for variety within categories, an attempt was also made to ensure that the stimulus material was presented in such a way as to delimit frame anticipation. The photographs were presented in five blocks of eight, one photograph from each category appearing in each block. The sequence of photographs in each block was determined by a random number generator. Since the sequencing of the photographs maximised variety, the possibility that subjects could predict the content of subsequent frames was thus reduced.

Procedure

Students were allocated on the basis of sex to one of two experimental groups so that the sex of the experimenter matched that of the subjects.

Before the experimental task was fully explained, students completed the

Telic Dominance Scale (TDS), the Sexual Behaviour Inventory ('SEXY') and the Pornography Variety Index ('PORNO').

Following this, a brief standardised statement of the experimental task was read. Students were then shown the first photograph for 20 seconds. The photograph was then removed and students were given 40 seconds to rate themselves on the dimensions. This procedure was repeated for each of the 40 photographs constituting the total picture set.

Results

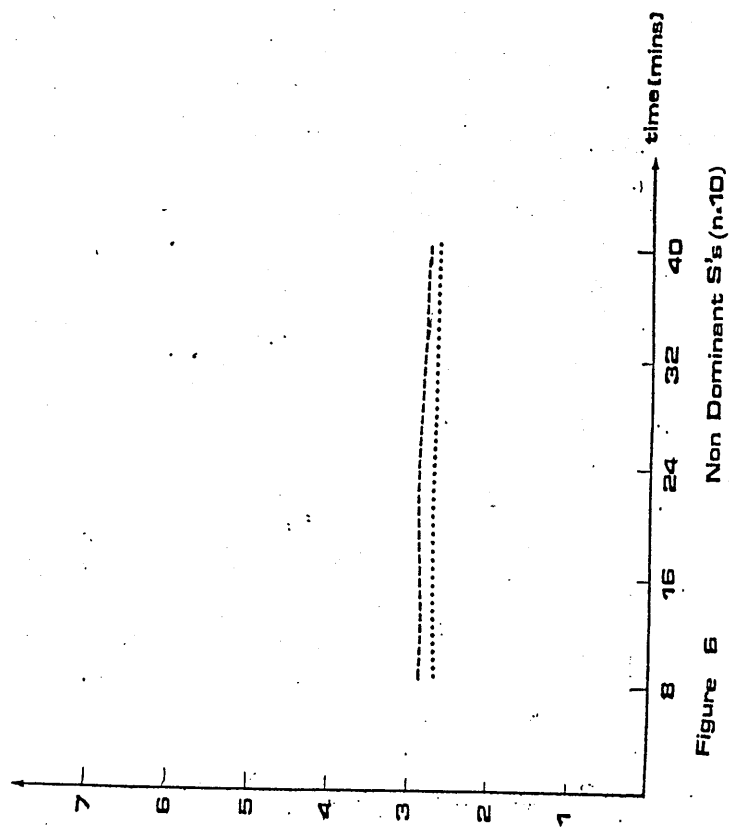
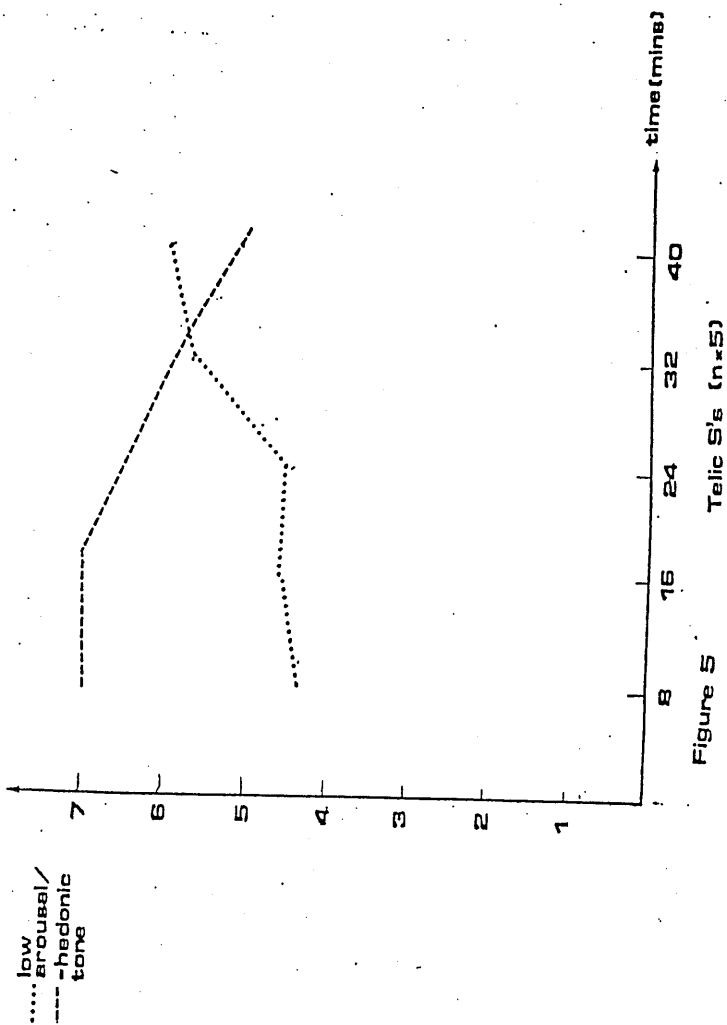
In studying the phenomenological responses as indicated by the self-rating scales of S's to the pictures presented during the experiment described above, some method of collapsing the data from 40 ratings on the two dimensions of arousal and hedonic tone dimensions was needed. Since this study does not examine specific picture effects, it was decided that the self-ratings would be examined at five points during the experiment. These points occurred after the presentation of each block of eight photographs at eight minute intervals. In each of these blocks Ss had viewed one photograph from each of the picture categories documented above. The mean of the summated self-ratings for each block were used as the state measure.

Figures 5 - 7 present the data concerning the self-rated phenomenological states for each of the three groups of Ss - telic dominant, paratelic dominant and non dominant - over time. The dimensions used are serious - playful, hedonic tone and excited - relaxed. Figures 5 and 6 show clear differences between telics and paratelics both in the levels of their state ratings and in the changes which occur over time. Telics begin by being moderately excited ($\bar{x} = 4.4$) which they find highly unpleasant ($\bar{x} = 7$) and

they gradually became more relaxed over time (ending with $\bar{x} = 5.8$) and this they would appear to find less unpleasant ($\bar{x} = 5$). In contrast, paratelics begin by being highly excited ($\bar{x} = 1.73$) and this they find very pleasant ($\bar{x} = 1.5$); as the experiment continues, they appear to become slightly less excited and, as they do so, they experience a lowering of positive hedonic tone. The non-dominant group show little change on any of the dimensions over time.

Three questions need to be asked about these data. First, are the differences in the trends between groups significant? Second, in what way are these differences significant? Finally, do these data confirm the predictions from reversals theory described briefly above?

To examine the significance of the differences between the three groups in the trends for each dimension over time, Friedman's test for differences in trends was used (Meddis 1975, p.118-119). The test examines the extent to which trends for matched measures differs between groups. For each self-rating scale, the differences between the trends reported by telics and paratelics was highly significant ($p < .001$), as might be anticipated from the inspection of Figures 5 and 6. The paratelic trend lines for all dimensions show a high degree of linearity when compared to the trend line for telics. Also, the trend lines for paratelics show clear relationships between state changes on the different dimensions whilst those for telics show greater variation. This is clear if correlation coefficients are calculated for the relationships between each dimension for both the telic and the paratelic groups. As the data presented in Table 6.12 shows, the positive correlations between arousal and hedonic tone demonstrates some linearity for telics whilst both dimensions display linearity for paratelics.



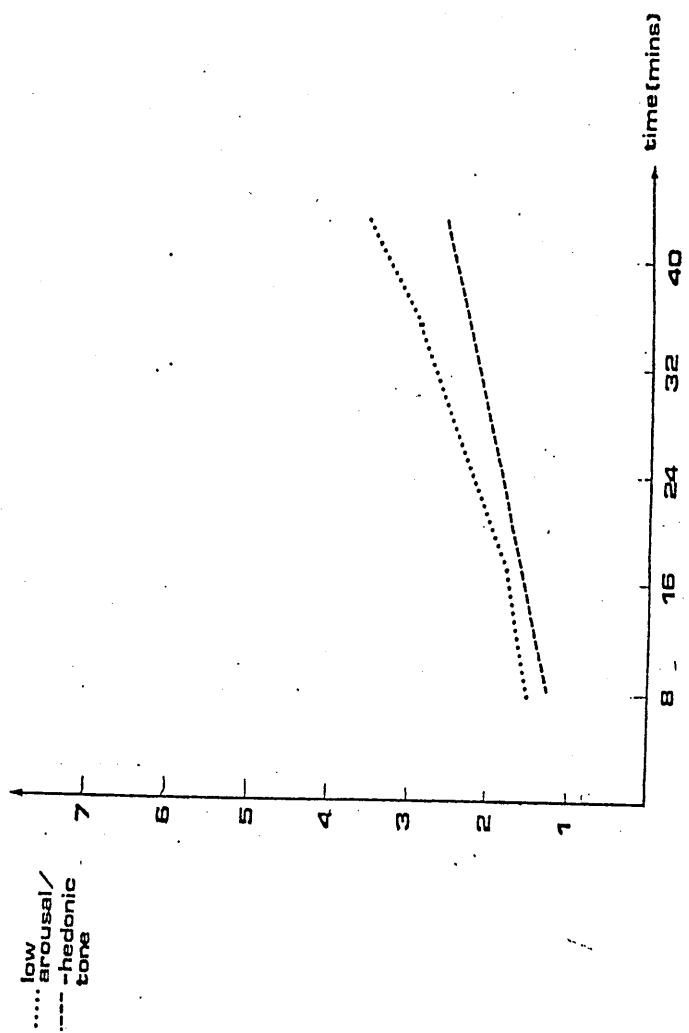


Figure 7

The data in Table 6.12 have other uses too. In particular, they demonstrate two clear differences between the direction of the relationship between state dimensions for these two groups: the relationship between hedonic tone and arousal is negative for telics and positive for paratelics - the less aroused the more positive the hedonic tone for telics and the more aroused the more positive the hedonic tone for paratelics. This would seem to offer considerable confirmation for the theory of reversals model of the relationship between arousal and hedonic tone for these two groups of subjects. Such confirmation, in that it offers validity to the theoretical constructs which underdetermine the TDS also offer a measure of validation for the TDS itself.

	TELIC S's (n = 5) HEDONIC TONE	PARATELIC S's (n = 13) HEDONIC TONE
AROUSAL	-.119	.969*

TABLE 6.12: Correlations between self-ratings on two dimensions for Telics and Paratelic S's (* indicates p .01, one tailed)

Studies by Fontana

David Fontana, working at the University College, Cardiff, has recently completed a study of obsessionality within the framework of the theory of psychological reversals (Fontana, 1978, 1981).

Fontana suggests that there are conceptual comparabilities between Smith and Apter's Reversal Theory and Freud's notion of reaction-formation, in

which the individual represses one end of an emotional dimension (eg, hate), and maintains this repression by over-exaggerating the other end of this same dimension (eg, love). Freud particularly associates this reaction-formation defence with the development of obsessional behaviour (see review by Kline, 1967). Freud considered obsessionalism as being of two forms. First, he envisages an obsessional personality characterised by traits such as obstinacy, orderliness, rigidity and over-control. In contrast, though related, he next envisages the obsessional neurotic who will, from time to time, exhibit such symptoms as compulsive and ritualistic behaviour. The obsessional personality (trait obsessionalism) reflects successful reaction-formation whilst the obsessional neurotic (symptom obsessionalism) reflects weak reaction formation which often leads to ambivalence between the hitherto dominant and repressed ends of the emotional dimension. A scale to measure both 'trait' and 'symptom' obsessionalism has been developed by Sandler and Hazari (1960).

Because of the parallels Fontana has drawn between successful reaction-formation and high levels of telic dominance (see Fontana, 1978), he hypothesised that scores on the TDS would correlate positively with the Sandler-Hazari scores for obsessional traits but that TDS scores would show a zero or near zero correlation with the Sandler-Hazari scores for obsessional symptoms.

To test these hypotheses, Fontana used two samples of subjects. Sample one consisted of 84 further education lecturers pursuing a part-time programme of further study. Sample two consisted of 30 mixed neurotics in regular attendance at the day-care unit of a psychiatric hospital. Both samples completed three tests, namely the TDS, the Sandler-Hazari test

and the EPI. The EPI was included in order to test the finding of Murgatroyd et al (1978) that none of the sub-scales of the TDS correlated significantly with extraversion or neuroticism.

Table 6.13 below gives the means and standard deviations of the two samples on each of the sub-scales for each of these measures. In addition the table presents the results of t-tests to examine the significance of differences in these scores between the two samples. It will be noted that although the EPI and the Sandler-Hazari measures discriminate between the two samples, the TDS does not.

Fontana then studied the relationships between the 8 variables for which he had obtained data for each of the two samples using Pearson product-moment correlations. These correlation matrices are presented as Tables 6.14 and 6.15 below.

Variable	Sample 1 (n = 84)		Sample 2 (n = 30)		t
	Mean	S.D.	Mean	S.D.	
Telic Dominance					
Serious-mind	5.40	2.37	6.07	2.09	-1.47
Planning Orient	6.04	2.24	5.72	2.10	0.69
Arousal Avoid	6.44	2.60	7.48	2.60	-1.89
Total Score	17.88	5.75	19.27	4.38	-1.37
Sandler-Hazari Inv					
Traits	10.18	3.13	12.10	3.14	-2.88**
Symptoms	7.12	2.94	11.93	3.30	-7.05**
Eysenck Pers Inv					
Extraversion	11.25	4.78	10.97	5.05	0.26
Neuroticism	9.06	5.23	17.33	5.35	-7.31**

TABLE 6.13: Means and standard deviations on the TDS, Sandler-Hazari and EPI by samples including t-tests (*indicates $p < .01$ ** ind $p < .001$)

	1	2	3	4	5	6	7
1 Extra							
2 Neurot	-.177						
3 Serious- mind	-.063	-.022					
4 Planning Orient	-.161	.015	.628***				
5 Arousal Avoid	-.405***	-.066	.388**	.281**			
6 Telic Dom	-.276*	-.033	.829***	.806***	.709***		
7 Traits	-.055	-.044	.339**	.403***	.243*	.419***	
8 Symptoms	-.199	.342**	-.202	-.023	-.039	-.110	.180

TABLE 6.14: Pearson product-moment correlation for eight variables for sample one (n = 84) (* indicates $P < .05$; ** indicates $P < .01$; *** indicates $P < .001$).

	1	2	3	4	5	6	7
1 Extra							
2 Neurot	-.215						
3 Serious- mind	.111	.107					
4 Planning Orient	-.086	.418*	.110				
5 Arousal Avoid	-.383*	.142	.005	.227			
6 Telic Dom	-.282	.337	.537***	.672***	.659***		
7 Traits	.091	.204	.030	-.256	.184	.001	
8 Symptoms	-.047	.498**	-.116	.094	.213	.230	.476**

TABLE 6.15: Pearson product-moment correlations for eight variables for sample two (n=30) * indicates $p < .05$; ** indicates $p < .01$ and *** indicates $p < .001$).

These data indicate two findings of interest to those concerned with the validity of the TDS. First, and most encouragingly, each of the sub-scales of the TDS and the TDS total score correlate positively and significantly with the obsessional trait scores for sample one but do not correlate significantly with obsessional symptoms for either sample, thus fitting well with Fontana's hypothesis derived from Reversal Theory. Second, and of some concern, the AROUSAL sub-scale of the TDS correlates negatively and significantly with extraversion for both samples. Also, PLANNER correlates significantly ($p < .05$) with neuroticism for sample two only.

Fontana further explored the associations recorded in Table 6.14 by means of factor analysis (principal components varimax rotation). The results of this factor analysis are presented in Table 6.16 below.

In his analysis of this table, Fontana suggests that :

'Factor one emerges as a clear factor of obsessional symptoms, on which neuroticism loads strongly. It has a weak bi-polar element containing three of the four Telic Dominance measures and Extraversion, but the loadings are too small to reach significance. Factor two is a genuine bi-polar one, with Extraversion the dominant positive element and Arousal Avoidance the dominant negative one. Factor three is a clear factor of Telic Dominance, which shows unequivocally the association between Telic Dominance and Obsessional Traits. It also indicates the absence of any such association with Obsessional Symptoms'.

(Fontana, 1970)

While the data presented by Fontana has many points of interest - especially the strong association between obsessional traits and symptoms for the clinical sample ($p < .01$) - the concern here is with the implications of Fontana's work for the validity of the TDS. Two such implications are noted by Fontana. First, the association between the AROUSAL sub-scale of the TDS and the Extraversion scale of the EPI does give rise for concern and may offer an explanation for the consistent finding that the AROUSAL sub-

Variable	Factors		
	1	2	3
1 Extra	-.171	.727	.137
2 Neurot	.603	-.087	-.032
3 Serious- mind	-.127	-.000	.505
4 Planning Orient	.054	.012	.519
5 Arousal Avoid	-.098	-.592	.126
6 Telic Dom	-.074	-.262	.483
7 Traits	.250	.201	.455
8 Symptoms	.715	.067	.018

TABLE 6.16 : Factor loadings on each of eight variables for three factors extracted by Varimax rotation for sample one (n = 84)

scale possesses different characteristics from the SERIOUS and PLANNER sub-scales. Secondly, the lack of significant differences between the two samples on the four TDS scores (see Table 6.13) suggests the need for the TDS to be standardised separately for non-clinical and clinical groups. As Fontana observes, 'It may even be that the Telic Dominance Scale is unsuitable for clinical subjects.....As it stands at present the scale does not appear to discriminate between clinical and non-clinical groups, which must indicate that it should only be used with the former with extreme caution.' (Fontana, 1978).

Studies by Matthews

Gerald Matthews¹, working in the Department of Experimental Psychology at the University of Cambridge, has examined the relationship between TDS scores and both the Sixteen Personality Factor Questionnaire (16PF) developed by RB Cattell and others (Cattell, Eber and Tatsuoka, 1970) and the Motivational Analysis Test (MAT), also developed by Cattell and his co-workers (Cattell, Horn and Sweeney, 1970).

114 graduates or recently graduated students completed the TDS, the 16PF and the MAT and a number of other scales as part of an experimental motivation study. Summarising Matthews' results, it was noted that :

- (1) the TDS did not correlate with individually presented items of the AH5 and the AH6 (Heim, Watts and Simmonds, 1970) test of intelligence;
- (2) the means on the TDS sub-scale scores are lower than those reported in Murgatroyd et al (1978), but not significantly so ;
- (3) the sub-scale inter-correlations for the TDS were lower (but not significantly so) than the sub-scale inter-correlations reported in Murgatroyd et al (1978) ;

¹ Mr Matthews has given permission for reference to be made to this work but has not permitted the full reproduction of the available data analysis prior to its publication elsewhere. The studies reported here were undertaken in 1982-83.

- (4) there are some significant correlations between certain 16PF scales and TDS sub-scale scores, in particular, the partial correlations (controlling for the F scale in the 16PF), show a significant negative relationship between F and AVOIDER and the TDS total score - so much so that only 29% of the reliably measurable variance of AVOIDER is not common to F (surgency vs desurgency);
- (5) there were no significant non-trivial correlations between TDS sub-scale scores and the integrated MAT variables ; however, TDS sub-scales are correlated with several unintegrated MAT variables, suggesting that the TDS is tapping unconscious (meta-motivational) modes.

Matthews is continuing to conduct studies which explore the inter-relationships between Cattell and Kline's theses of personality, motivation and state (Cattell and Kline, 1977) and those of Apter and his co-workers.

In terms of the validity of the TDS, it is important to note the description of the F primary provided by Cattell et al (1970) as a person who is unworrying, cheerful, enthusiastic (surgency) versus the person who is pessimistic, subdued, cautious (desurgency). It is noticable that the most significant correlations with the F primary in the TDS occurs in relation to arousal avoidance. The significance of this is that F is known also to correlate highly with Zuckerman's sensation seeking scale (Zuckerman, 1974). Thus it is possible that the factor space associated with the arousal effective component of the TDS is grossly similar to that occupied by the Zuckerman scale, the F primary of the 16PF and the impulsiveness component of the Eysenck Personality Inventory. The F primary does not, however, correlate well with the cognitive features of the TDS - planning orientation and seriousmindedness until second order partials are examined. What is

needed to explore Matthew's findings further, is a double sample regressive study of these variables and it is this that Matthews is hoping now to complete. Meanwhile, some caution needs to be expressed about the location of the TDS variables in relation to the particular factor space occupied by the F primary and related variables.

About the EPI

In commenting upon the work of Matthews, it was suggested that the affective component of telic dominance - arousal avoidance - may be occupying an adjacent on the same factor space as the F factor, the Zuckerman sensation seeking scale and the impulsiveness component of the Eysenck personality Inventory. This final section of this Chapter examines all the available data from any source concerning the relationship between the TDs and the EPI and presents some new data from a sample of a particular adult population.

Table 6.17 presents a summary of these studies to date. In all there are eight data sets, four of which are reproduced and discussed above and three are available for general scrutiny (Murgatroyd, et al, 1978; Fontana, 1978, 1981).

The study by Mair Watts sampled ten married couples and asked them to complete both the TDS and the EPI. Only TDS total scores are available from her to date and the means, sd's are given in Table 6.18 below. As is clear from this table, the TDS scores are highly unusual - showing an unusual standard deviation and a higher than hitherto mean for the TDS as a whole. The unusually large variance may in itself account for the correlations given in Table 6.19 below. There are no statistically significant correlations in these data.

Year	Researcher	n	Type of Sample	Correlations with Extraversion - Introversion	Correlations with Neuroticism	Comments
1978*	Murgatroyd, et al	112	Adult (OU) student Population	NS	NS	Used 'mini EPI'
1979	Svebak	33	Undergraduate students	SERIOUS ($r = -.399$, $p < .05$); AVOIDER ($r = -.409$, $p < .05$)	NS	Used TDS in translation
1979	Watts	20	Married couples	NS	NS	
1979	Konrad	30	Undergraduate students	AVOIDER ($r = -.355$, $p < .05$)	NS	
1981*	Fontana	84	Adult teachers	AVOIDER ($r = -.405$, $p < .001$)	NS	
1981*	Fontana	30	Clinically categorised neurotics	AVOIDER ($r = -.383$, $p < .05$)	PLANNER ($r = .418$, $p < .05$)	
1982	Murgatroyd	250	Adult (OU) students	AVOIDER ($r = -.169$, $p < .01$)	NS	
1983	Murgatroyd	300	Adults	NS	NS	

TABLE 6.17: The TDS and the EPI
(* indicates a published paper)

	Mean (\bar{x})	sd (0)
TDS TOTAL	24.3	22.13
Extroversion	11.45	4.41
Neuroticism	9.15	3.5

TABLE 6.18: Means and Standard Deviations of the TDS and EPI from Mair Watts Study (n=20)

	1	2	3
1 TDS	-		
2 Extroversion	-.302	-	
3 Neuroticism	.011	.042	-

TABLE 6.19: Correlation Coefficients (Pearson) for Mair Watts Data

Veronica Konrad, like Mair Watts, an undergraduate student, surveyed 30 undergraduate students of psychology with both the EPI and the TDS. The means and standard deviations for each of the sub-scales on the total score for the TDS and the two scales of the EPI are given in Table 6.20 below. Unlike Mair Watts' data, these data are much more in keeping with the established means and sd's for the TDS. Table 6.21 gives the correlations for the TDS and the EPI. As recorded on Table 6.22, this study shows a significant relationship between the affective component of telic dominance and extraversion.

	Mean (\bar{x})	sd (s)
Extraversion	11.96	4.56
Neuroticism	10.63	5.02
SERIOUS	3.8	2.16
PLANNER	4.4	2.90
AVOIDER	3.9	2.40
TDS TOTAL	12.1	5.04

TABLE 6.20: Table of means, sd's for Veronica Konrad's data (n=30)

	1	2
1 Extraversion		
2 Neuroticism	-.326	
3 SERIOUS	.133	-.122
4 PLANNER	.055	.300
5 AVOIDER	-.355*	.217
6 TDS TOTAL	-.083	.330

TABLE 6.21: Correlation Coefficients for Veronica Konrad's data (n=30)
(* p<.05)

The 1982 study by Stephen Murgatroyd used the EPI (not the Mini EPI) and the TDS with 250 mature adult students studying at the Open University (average age = 29.3). The means and sd's are as given in Table 6.22 below and the correlation coefficients are given in Table 6.23.

	Mean (\bar{x})	sd (0)
Extraversion	10.32	4.1
Neuroticism	12.37	3.9
SERIOUS	5.95	2.38
PLANNER	5.32	2.31
AVOIDER	6.47	2.93

TABLE 6.22 : Means and sd's for 1982 Murgatroyd Study (n = 250)

	Extraversion/ Introversion	Neuroticism
SERIOUS	.057	-.029
PLANNER	.008	-.049
AVOIDER	-.169*	-.077

TABLE 6.23 : Correlation Coefficient (Pearson) for Murgatroyd 1982 data (n=250) (* indicates $p < .01$).

These data follow clearly the pattern established by Fontana (1978, 1981) for AVOIDER, though there is no replication of the association between PLANNER and neuroticism evidenced in the former study. Not only is the relationship between AVOIDER and extraversion present, it is also stronger ($p < .01$) than hitherto detected.

So as to examine this phenomenon further, Murgatroyd conducted a structured sample study of the relationship between the EPI and the TDS. 300 adult

residents of a small village in Gwent (total adult population 410) completed the TDS and EPI. Table 6.24 gives the means and sd's for these data whilst Table 6.25 shows the correlation coefficients.

	Mean	sd's
Extraversion	10.97	3.92
Introversion	11.32	4.61
SERIOUS	4.5	2.6
PLANNER	6.2	2.4
AVOIDER	3.8	2.3
TOTAL	14.1	4.8

TABLE 6.24: Means, sd's for the 1983 Murgatroyd Study (n = 300)

	Extraversion/ Introversion	Neuroticism
SERIOUS	-.082	-.032
PLANNER	-.032	-.121
AVOIDER	-.102	-.098
TDS TOTAL	-.093	-.086

TABLE 6.25: Correlation Coefficients (Pearson) for the Murgatroyd 1983 data (n=300)

These data show no relationship between the TDS and the EPI though the AVOIDER extraversion correlation approaches significance*.

* to be significant at $p < .05$, r would need to $> .113$

The importance of this study is that it is the only one of those given in Table 6.17 that does not involve a sampling decision relating to a specific group. 73% of the total adult population of a village completed the two scales irrespective of their occupational, academic or clinical status.

What can be concluded from these data? When taken together with the work of Matthews, briefly reported here, it seems clear that the affective component of telic dominance is closely associated with (if not occupying the same factor space as) the F primary and extraversion as determined in Cattell and Kline (1977) and Eysenck and Eysenck (1972) factor analytic studies of personality. Equally clear for normal subjects (as opposed to clinically defined neurotics) is that the cognitive dimensions of telic dominance - seriousmindedness and planning orientation - do not tie to this same factor space. According to Apter (1982, esp. at 52 - 58) and Svebak (1982), seriousmindedness is the essential characteristic of the telic-paratelic distinction; arousal avoidance is the way in which this cognitive component is felt in experience. This helps us understand why there is such a difference (in relation to personality characteristics) between AVOIDER and the two other sub-scales of the TDS - arousal avoidance is, in reversal theory terms, the artefact of cognitive orientations. Nonetheless, it is of some psychometric concern that the AVOIDER sub-scale should show some relationship with extraversion in some cases. Further work is needed to clarify the specific area, of the personality factor space which AVOIDER is occupying. Gerald Matthews is now beginning this task.

Conclusion

A number of studies have been reported in this Chapter. It would appear, especially from the studies by Aris and Murgatroyd, Fontana (1978, 1981) and Ray (Murgatroyd et al, 1978), Apter (Murgatroyd et al, 1978) and Svebak (1982) that the TDS can be regarded as having good construct validity. That is, when used as an instrument in exploring a particular theoretical proposition from reversal theory, the TDS does appear to have validity even when the data are physiological rather than psychological (see esp. Svebak and Murgatroyd, in press as Appendix 4).

Where the TDS appears weak is in relation to its factorial validity, especially given the studies by Matthews, Fontana (1978, 1981), Svebak, Konrad and Murgatroyd's 1982 study, fully discussed above. Further work is needed to examine the location of the telic dominance (and arousal avoidance in particular) in the already over-populated factor space known as personality.

Caution is also needed when looking at clinical populations for, as Fontana (1978, 1981) has observed, the TDS does not discriminate well between normal and clinical populations. But then it was not intended to. There is no argument advanced in Smith and Apter (1975), Apter (1982), Murgatroyd (1981), Apter and Murgatroyd (in press), Apter and Murgatroyd (forthcoming) that clinical conditions are solely a function of higher or lower levels of telic dominance. Indeed, the thrust of much of the clinical material resulting from reversal theory (see esp. Blackmore and Murgatroyd, 1980) to date has been to examine meta-motivational dominance in relation to the reversal dynamics of the person. Dominance of itself is not a prediction of clinical conditions. The need for caution with the

TDS for clinical subjects arises more from the finding that PLANNER is correlated with neuroticism in Fontana's study (1978). Though his sample is small (n=30), it may be the case that clinical subjects responses are cautioned by their clinical conditions. In Fontana's study of neurotic obsessionals, for example, it is their planning for obsessional behaviour that appears to be the basis for their neurosis (Fontana, 1981).

In other respects, the TDS does appear to measure what it purports to measure. There is a need for continuing vigilance, validity can never be answered 'once and for all'. What is being said here is that a beginning has been made in the construction of an instrument which, whilst not without its problems, appears to have good construct validity.

CHAPTER SEVEN

SCALE NORMS FOR THE TELIC DOMINANCE SCALE

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Introduction

In this Chapter, means and standard deviations for each of the sub-scales of the TDS are presented for different values of a number of social-economic variables relating to a sample of 945 Open University students. These tabulations include those for occupation; educational ability, sex and age.

The Uses of Normative Data

Before presenting these data, it is first necessary to document the use of normative data.

The primary use of normative data is to establish the extent to which the scores of a particular individual differ from those of other individuals who are grossly similar in some important respect. This use of normative data is commended by Guilford (1973, p.461), who indicates that this is the major reason for collecting scale-norm data. Cattell (1973 p.428), suggests that there are other uses of scale norms which are sometimes overlooked by researchers. Most important, he suggests, is the fact that norms change over time. He cites the case of intelligence tests, such as the Stanford-Binet. It is known that 'traditional intelligence tests have shifted their norms upward by about one half sigma in the last generation: the trend on the level of crystallised intelligence is substantial(an) intelligence test therefore has a standardisation that is obsolete from the moment it is completed' (Cattell, 1973 p.428-429). These changes over time in scale norms require a thoroughgoing trend analysis. Lynne (1979) has demonstrated that cultural factors and events have an influence upon the nature of changes in personality and intelligence scores over time.

A second use of normative data to which Cattell refers relates to the modification and improvement of tests as a result of the process of 'progressive rectification'. As he observes, 'small percentages of item change can be handled by changing the mean and sigmas of the scales by comparison of the mean, sigma and covariance obtained on large samples, for the new items only, with those of the replaced items; but this can be trusted up to a point, and restandardisation inevitably becomes periodically required'. To modify a scale requires normative data so that the consequences of the modification can be subject to critical scrutiny and so that the comparison between revised and original forms of a test can be made. These three uses of normative data - in studying individual differences, in examining changes over time and in scrutinising the effects of progressive rectification - constitute the primary uses to which such data is put.

Sampling Considerations

In the standardisation of any psychometric tests the sampling decisions made by the researcher act as crucial determinants of the utility of the normative data presented.

Many test handbooks do not provide adequate details of the sampling procedures used when standardisation was being attempted. As Cattell observes, 'encompassing 2000 or 3000 in a correctly stratified sample is better than 10,000 not so representatively sampled', (Cattell, 1973, p.428). A stratified sample is one in which random samples are drawn from within pre-determined, existing social groups. The use of stratified sampling should ensure that the scale norms reflect differences between social groups (defined by reference to sex, age, educational level and occupation),

and that the data for each group reflects the variance that is likely to exist within the population that constitutes the group. Under ideal conditions, the stratified random sample should be taken from the general population and should not be restricted to a particular social class or be defined by an exclusive criterion, such as membership of a particular organisation or social class. This applies to tests which do not depend for their validity on specific group-reference norms. In the case of a test which purported to measure the suitability of subjects for, say, a particular occupation there would be a need to sample randomly within that occupational group. For a measure, such as the TDS, which does not purport to measure the especial characteristics of a particular social group, but which offers a measure on scales applicable to all adults, stratified random sampling of the general population is highly desirable for standardisation purposes. Standardisation data from such a stratified sample is not yet available for the TDS. Nor was it possible, given the resources available for the studies reported in this thesis, to conduct such a study. However, it was possible to collect data from 945 adults, aged between 21 and 78, who were registered as part-time students of the Open University in Wales and who were selected as a random sample using one-third of all those listed on a serial number listing available as at 1 January, 1976.

A sample of Open University students is not comparable with conventional University students for three reasons. First, the age range of Open University students is considerably greater than the age range of conventional University students. Second, Open University students undertake their degree studies in addition to other employment; in contrast the majority of conventional students are maintained as students by their local education authority and work exclusively in vacations. Finally, unlike conventional

Universities, the Open University has no academic entry pre-requisites: a person can become an undergraduate student whatever qualifications they have or if they have none at all. For these reasons, Open University students come from a variety of occupations and have a variety of educational qualifications.

Having indicated that the sample from which the data presented in this Chapter was acquired are not traditional University students, it is necessary to examine some of the features which might affect the TDS scores of this sample because they are degree level, part-time students. First, the extent to which these adults are NACH motivated is seen to be high relative to the motivation of other adults in the community. Secondly, the Open University is a highly systemised learning organisation which sets out deliberately to encourage its students to take decision making seriously and to plan ahead. Indeed, choice of subjects is made at least ten months before the start of each course, requiring considerable forward planning on the part of the students. Thirdly, it has been suggested that students who are essentially paratelic, especially in relation to the arousal avoidance dimension, are less likely to succeed in a learning system which gives emphasis to telic acts and which, by virtue of the fact that it is primarily a distance teaching institution, minimises the extent of interpersonal contact and emphasises independence (Woolfe and Murgatroyd, 1979). It may well be that this assertion, when coupled with the two related observations suggest that this sample will be more telic than samples drawn from other populations. As will be shown, the data available from the sample of Open University students does not, when compared with data from the other non-Open University samples, appear to be significantly more telic, but this must remain as a caution in the use of the scale norms given here.

The Sample

The sample used for the construction of the scale norm tables below consists of 945 adults, 368 females and 577 males, aged between 21 and 78 (mean age 32 years). It was chosen by means of a simple random sampling procedure: a numerical listing of all registered students of the Open University in Wales as at 1 January, 1976 was obtained and each third person was surveyed and asked to complete the TDS as part of a study of adult learning. This sample included 112 students who had completed their first year studies, 250 students who had completed at least two years of study and 583 students who had registered but who had not yet started their course of study.

The means and standard deviations for each sub-scale for the sample (n=945) are given in Table 7.1 below. These data differ only slightly from those given in Table 4.1 above and a t-test showed there to be no statistically significant differences between this sample and that used for the scale reliability studies reported in Chapter Four.

	SERIOUS	PLANNER	AVOIDER
x	5.95	5.33	6.47
(sd)	(2.38)	(2.31)	(2.93)

TABLE 7.1: Means and Standard Deviations for Survey Sample (n = 945)

Sex Differences

Table 7.2 presents data for each sub-scale for both male and female.

Whilst these data show again a degree of kurtosis, with the data steered towards the paratelic end of this dimension, there would appear to be only slight differences between the sexes, with males showing a marginally more telic response pattern than females. Indeed, when a t-test was performed it was found not to be significant ($t = 3.12$, NS). Sex differences are not, therefore, included in subsequent tables.

SEX	SERIOUS \bar{x} (sd)	PLANNER \bar{x} (sd)	AVOIDER \bar{x} (sd)	n
Female	5.82(2.68)	5.11(2.48)	6.37(3.55)	368
Male	6.03(2.16)	5.48(2.18)	6.45(2.42)	577

TABLE 7.2: Means (\bar{o}) for each of the three sub-scales of the TDS by sex ($n=945$).

Age Differences

To examine the extent to which TDS sub-scale scores are affected by age, Table 7.3 was constructed with age shown in terms of four categories, which are self-explanatory in the table below. From inspection, it would appear that age acts as a determinant of scores, especially in relation to the SERIOUS sub-scale, with a positive correlation between age and each sub-scale being suggested.

AGE	SERIOUS \bar{x} (sd)	PLANNER \bar{x} (sd)	AVOIDER \bar{x} (sd)	n
21 - 29	5.61 (1.80)	5.06 (2.13)	5.83 (1.95)	340
30 - 44	6.00 (1.658)	5.22 (2.17)	6.67 (2.08)	425
45 - 54	7.16 (2.02)	5.73 (2.19)	6.84 (1.73)	141
55 and over	7.37 (1.02)	6.45 (2.14)	7.40 (2.10)	39

TABLE 7.3: Means (\bar{x}) for each of the sub-scales of the TDS by age groups (n = 945).

Indeed, as indicated in Table 7.4, the correlations between age and both the SERIOUS sub-scale ($p < .01$) and the PLANNER sub-scale ($p < .01$) are significant.

	SERIOUS	PLANNER	AVOIDER
AGE (n = 945)	.101*	.087*	.011

TABLE 7.4: Pearson product moment correlation coefficients between age and each sub-scale of the TDS (* indicates $p < .01$).

Occupational Differences

Differences due to the occupational status of subjects were examined in this study following the classification of occupations by means of the standard form adopted by the Open University*. Table 7.5 presents the

* For a full description of these occupational categories - essential for the careful interpretation of these data - please see Appendix 3.

means and standard deviations for each sub-scale across thirteen occupational categories.

The most interesting difference between occupational groups occurs in relation to the AVOIDER sub-scale, with some groups scoring below the mean of the total sample (housewives, armed forces, administration and management, technical personnel, electrical and allied trades, clerical and office staff and shopkeepers, sales staff and policemen), whilst others score significantly above the mean (qualified scientists and engineers, farmers, miners and those engaged in manufacturing and also those engaged in the transport and communications industry). Two groups (housewives and shopkeepers and salespersons and policemen) are consistently below the

OCCUPATION	SERIOUS x (s)	PLANNER x (s)	AVOIDER x (s)	n
1. Housewife	5.38 (2.23)	4.57 (2.37)	5.85 (2.04)	141
2. Armed Forces	6.44 (1.60)	5.83 (.66)	6.00 (2.93)	20
3. Administration & Management	6.93 (1.27)	6.86 (2.41)	5.43 (2.50)	30
4. Teachers & Lecturers	5.91 (2.90)	5.29 (2.42)	6.90 (4.57)	230
5. Professions and the Arts	6.00 (2.18)	5.32 (2.46)	6.61 (2.28)	97
6. Qualified Scientists and Engineers	6.73 (2.01)	6.85 (1.56)	7.77 (2.20)	27
7. Technical Personnel	5.5 (2.07)	5.34 (1.72)	6.06 (1.75)	105
8. Electrical, Metal and Allied Trades	6.60 (2.06)	5.18 (1.68)	6.31 (2.23)	48
9. Farming, Mining, Manufacturing	6.72 (3.70)	6.61 (3.36)	7.67 (3.68)	40
10. Communications & Transport	5.62 (1.70)	5.25 (2.06)	8.00 (2.94)	20
11. Clerical & Office Staff	6.20 (2.26)	5.75 (2.64)	5.97 (2.23)	103
12. Shopkeepers, Sales & Police	5.87 (2.30)	4.00 (2.20)	6.19 (2.19)	40
13. Retired	6.23 (2.58)	5.5 (2.00)	7.23 (1.85)	44

TABLE 7.5: Means (s) for each sub-scale of the TDS by occupation (n = 945).

total sample mean on each of the sub-scales, whilst four groups (professions and arts, qualified scientists and engineers, farming and mining and manufacturing and retired) are consistently above the sample mean on each sub-scale. In the case of retired persons, this may, as was noted above, be a function of age. But differences between other occupational groups are not so readily explained. It should be noted, however, that there are significant differences in the sample sizes between these various groups. Since the sample is not a stratified sample of the general population, or a true random sample of these occupational groups, some considerable care is needed in interpreting these figures. In particular, note should be taken of the observations made about the fact that Open University students are likely to be more telic than other social groups: it may be that the differences observed between occupations are a function of differing strengths of motivation for and acceptance of the Open University's purposes. Nonetheless, these data suggest that the exploration of occupational differences in the extent of telic dominance should be a key feature of future standardisation studies.

Educational Differences

Some of the differences between occupational groups observed above may well be due to the differing levels of education and training which membership of occupational groups may involve. For example, membership of a professional body may involve, as a pre-requisite, an educational qualification which requires the diligent and serious pursuit of an approved programme of studies. Since occupational status and educational performance may, in this way, be related, it is necessary to examine the relationship between TDS scores and educational attainment.

Table 7.6 presents the means and standard deviations for each sub-scale for twelve categories of educational qualification possessed by respondents. It will be noticed that the majority of subjects (526 subjects, 56% of the sample) have undertaken some formal study since leaving school and that a further 601 subjects would satisfy the matriculation requirements for conventional university students. This indicates that the sample is heavily biased towards a high level of educational attainment relatively to the population as a whole. This again suggests the need for stratified random sampling within occupational groups so as to ensure adequate representation of subjects who do not meet the minimum entry requirements of British Universities.

HIGHEST EDUCATIONAL QUALIFICATION	SERIOUS x (σ)	PLANNER x (σ)	AVOIDER x (σ)	n
1. No formal qualifications	7.31 (2.15)	5.50 (1.94)	6.70 (2.68)	86
2. CSE's only	6.60 (2.51)	5.30 (2.49)	5.95 (2.41)	40
3. 1 - 4 'O' levels	6.10 (1.98)	4.48 (2.37)	5.95 (2.52)	75
4. 5 or more 'O' levels	5.73 (2.06)	5.14 (2.24)	6.83 (1.98)	110
5. 1 'A' level	5.55 (2.96)	4.85 (2.72)	6.25 (3.67)	33
6. 2 or more 'A' levels	5.43 (2.10)	4.98 (2.15)	5.63 (1.88)	75
7. ONC or OND	5.37 (1.92)	5.50 (2.13)	6.91 (.87)	56
8. HNC or HND	6.20 (2.15)	6.48 (1.66)	6.59 (2.20)	71
9. CERT ED	5.96 (2.86)	5.30 (2.58)	6.57 (4.43)	211
10. University Diploma or equivalent	5.45 (2.32)	4.82 (2.43)	6.54 (2.37)	133
11. 1st degree	6.00 (2.58)	6.00 (1.25)	6.81 (2.99)	45
12. High Degree	6.50 (.71)	6.25 (1.77)	9.50 (.71)	10

TABLE 7.6 : Means (σ) for each sub-scale of the TDS by highest educational qualification (n = 945).

That personality factors do relate to academic performance is an established hypothesis. For example, a variety of studies have shown that mildly neurotic introverts gain considerably more academic success than either their highly extravert or highly neurotic age-mates (Cowell and Entwistle, 1971; Entwistle and Entwistle, 1970; Entwistle and Cunningham, 1968; Eysenck, 1972; Eysenck and Cookson, 1969). It is interesting to note, then, that the highest educational groups have the highest scores on the AROUSAL sub-scale and that the group with the lowest level of educational qualifications have also the highest scores on the SERIOUS sub-scale. It may well be that the educational performances of students on examinations which they have in common would be a profitable area for study using the TDS.

Conclusion

This Chapter has presented scale norms for the TDS in terms of sex, age, occupation and educational qualifications. Whilst these norms have some value at this stage of the development of the TDS, the fact that all members of the sample shared a common commitment to educational advancement and the fact that all belonged to an educational institution which pursues what might be regarded as a highly structured programme of serious study requiring careful planning, should caution the use of these tables. Stratified random sampling across the adult population is a pre-requisite for full test standardisation - a task which appears urgent in the light of the growth in the use of the TDS at this time.

CHAPTER EIGHT

PROBLEMS AND CONCLUSIONS

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Introduction

Though not all of the data presented in this dissertation is fully supportive of the proposition that the Telic Dominance Scale is a valid and reliable instrument measuring the degree of paratelic or telic dominance of a person, the bulk of the data presented supports this proposition. More work is needed to examine: (a) the relationship between the TDS and measures of seriousmindedness, playfulness, sensation seeking and arousal seeking; and (b) the precise relationships between the TDS and other personality variables. In addition, a close examination of the factor structure of the TDS across a number of samples is also desirable in the light of the poor relationship between some of the sub-scales and the factor scales described in Chapter Five. Cross-sectional standardisation data is also needed if scale norms are to be developed.

Some (as yet uncompleted) studies of the TDS report difficulties with the "Middle-class bias of items". For example, Myra Thomas (personal correspondence) reports working class respondents finding items such as 'compiling a dictionary for financial reward / write a short story for fun' (Item 1), and 'always trying to finish your work before you enjoy yourself' / 'frequently going out for enjoyment before all your work is finished' (Item 26), not to relate to either their own experience or their social world. This is clearly a source for concern and may require some re-development of the scale if such items inhibit responses. In the same correspondence, however, Thomas does report that all her subjects (n=120) did, however, complete the scale.

These suggestions for continuing with the task of validating the scale are the traditional concerns of psychometricians. In this concluding Chapter, some issues about the relationship between the TDS and the theory of psychological reversals will be examined. In particular, some critical comments by Apter (1982) will be reviewed and the importance of alternative ways of assessing telic dominance will be suggested. The work of Svebak and Murgatroyd (in press) will be highlighted as offering some new directions for future study.

Comments by Apter

Apter (1982) makes a number of comments about the TDS and its relationship to reversal theory (see esp. at p. 235-236). In particular, he briefly looks at three criticisms. These are :

- (a) "...the extent to which the preferences expressed reflect the underlying dominance of one system or the other, and how far they reflect reactions to the environment in which the individual typically finds himself" - the problem of person:environment;
- (b) "...how far an individual is able to judge what his usual preferences are rather than his current preferences" (my emphasis) - the problem of trait:state measurement; and
- (c) "...a given choice of action does not necessarily of itself imply one state or another, and certainly cannot be equated unequivocally with one state" - the problem of phenomenological grounding

Though these comments are presented to highlight both specific difficulties with the TDS which Apter envisages others may wish to examine, it is also important to note that these comments are also being made about psychometric procedures in general.

The extent to which the TDS measures dominance in terms of the person as opposed to the degree of 'telic' or 'paratelic' dominance in the persons environment can only be examined by : (a) studying the scale scores of socially different groups of subjects; (b) studying the scale scores of groups of subjects across different cultures and countries, and (c) examining the scores of subjects in induced environments. The comments from Myra Thomas' unpublished study (see above) about the social class bias of certain items suggest that this issue may be a problem requiring further study. But the TDS has been used in studies in Canada, Norway, Sweden, Spain, Belgium and Britain and no significant differences in the mean sub-scale scores have been noted from those published in Murgatroyd et al (1978). Whilst it may be argued that these cultures create grossly similar environments or that the subjects selected in each of these countries (predominantly University undergraduates) are located in grossly similar environments, these data suggest that the TDS measures dominance in a consistent way across cultures. To date, no studies have been undertaken in which particular environments are induced (psychologically or chemically) prior to the completion of the TDS; such a procedure would be most unusual in the history of trait based motivational or personality measures and would be unlikely to yield data which would conclusively resolve this problem. Yet, without the systematic control of the key variables (the person or the environment), this difficulty will not be resolved.

The extent to which the TDS measures current preferences (ie, reflects the persons current state) as opposed to their usual preference (ie, their general disposition), is not a problem unique to this psychometric instrument. The problem is most usually examined by test:re-test reliability studies, reviewed in Chapter Four. These suggest a satisfactory

level of reliability over different time spans, suggesting that individuals are completing the instrument within a consistent frame and this would not be anticipated if responses were more associated with states than traits. As Apter (1982, p.235) observes:

"...the high test-retest reliability correlations for periods up to a year imply that the test is measuring some reasonably enduring personality characteristic rather than a current state and, by the same token, that people can make such general judgements of the kind required by the test."

Whilst the available data supports the assertion that the TDS generally measures dominance and is consistent in doing so over time, this is not to say that each individual completion of the scale will necessarily achieve a trait rather than a state measure. Care needs to be taken to ensure that the instructions of the test are clearly understood by subjects so that the influence of current states is minimised.

But the most critical observation made by Apter is that relating to the phenomenological grounding of the TDS. Responding to a pencil and paper instrument involves a reduction of a person's complex phenomenological world in terms of categories of choice determined by others. Such a pencil and paper test of dominance tells us little of the phenomenological world of the person: we are able only to make inferences about this world. Though the items in the TDS arise from the phenomenological world of the test authors, there is no necessary connection between their world and that of subjects completing the TDS. Thus, the TDS involves a degree of 'objective reductionism' (Thines, 1977). Whilst Apter cites particular forms of this - including the inference of a connection between usual preferences for action and usual action - the essential validity question to be asked concerns the extent to which scores on this scale relate to the dominance

of the telic or paratelic state in the person's own phenomenological experience.

This issue is explored in a recent paper by Sven Svebak and Stephen Murgatroyd, reproduced as Appendix 4. The aim of the study reported in this paper was to examine dominance in relation to: (a) behaviours in a perceptual motor-task; (b) psycho-physiology, and (c) the subject's own accounts of their recent experiences. In this extreme group study, where extreme groups were selected on the basis of SERIOUS sub-scale scores on the TDS, significant differences were noted in task performance, psycho-physiological responses to the task (especially in relation to muscle tension) and in the style and content of the data obtained by means of interview. Indeed, as the paper makes clear, interviewing data permitted both correct allocation of subjects to dominance groups and the ranking of subjects within each group (see Appendix 4 at p.13).

The value of this study lies in the extent to which different methodologies - survey, experiment and interview - are able to, independently, examine the nature and extent of telic dominance. The paper may be seen to suggest both a multi-method validation of the TDS and to point to the phenomenological relevance of the dominance construct to the data gained by interviews.

Whilst the Svebak and Murgatroyd study given in Appendix 4 offers a further validation of the TDS, it does not resolve the issue of phenomenological grounding as raised by Apter (1982). The problem of objective reductionism and atomism is an implicit feature of psychometric procedures. To achieve a greater degree of phenomenological grounding requires other methods, such as Q-sorting (Stephenson, 1953), repertory grids (Fransella and Bannister, 1977) or phenomenological psychology (Thines, 1977) to be used.

Conclusion

Reviewing the data available, it is suggested that the TDS is a reliable and valid measure of telic or paratelic dominance, which is easy to administer and score. Though further work is required to examine the factor structure and location of the scale and to establish norms for differing groups, the scale does appear to measure the constructs its authors envisaged during its construction. Though doubt remains about the phenomenological grounding of the scale, it is suggested that such doubts are inherent in the psychometric methodology. A multi-method validity study, offered in Appendix 4, suggests that the TDS is successfully measuring significant psychological, physiological and phenomenological differences for extreme groups of subjects. The scale may, however, need some redevelopment if studies in progress continue to show a class bias in response and/or significant ties with the scales developed by Cattell, Eber, and Tatsuoka (1970) and Eysenck and Eysenck (1969).

REFERENCES

Abelson H, Cohen R, Heaton E and Suder C (1970)
Public Attitudes Towards and Experience with Erotic Materials -
Technical Reports of the Commission on Obscenity and Pornography, No. 6
Washington, DC : US Government Printing Office

Aero R and Werner E (eds) (1981)
The Mind Test
NY : William Mason

Allport, GW (1937)
Personality - A Psychological Interpretation
NY : Holt

Allport, GW (1960)
Personality and Social Encounter
Boston : Beacon Press

Anastasi, A (1948)
'The Nature of Psychological Traits'
in Psychological Review, Vol 55, pp. 127 - 138

Anastasi, A (1976)
On the Formation of Psychological Traits
American Psychologist, Vol. 25, pp. 889 - 910

Anastasi, A (1968)
Psychological Testing
NY : Macmillan (2nd Edition)

Apter, MJ (1970)
The Computer Simulation of Behaviour
London : Hutchinson

Apter, MJ (1982)
The Experience of Motivation - A Theory of Psychological Reversals
London : Academic Press

Apter, MJ (1979)
Human Action and The Theory of Psychological Reversals
in Underwood, G and Stevens R (eds) :
Aspects of Consciousness - Psychological Issues
London: Academic Press

Apter, MJ (1981)
'The Possibility of a Structural Phenomenology - The Case of
Reversal Theory'
Journal of Phenomenological Psychology
Vol. 12 (2), pp. 173 - 187

Apter, MJ and Murgatroyd, S (in press)
Structural Phenomenology and the Eclectic Practice of Individual
Psychotherapy.
Dryden, W (ed) : Psychotherapy in Britain
London : Harper and Row

Apter, MJ and Rushton, C (1981)
Reversal Theory and Personality
Wills. South West Inter-Clinic Conference

Apter, MJ and Smith, KCP (1983)
'Empathy and Mastery'
European Journal of Humanistic Psychology, Self and Society
Vol. 11(1), pp. 40 - 46

Apter, MJ and Smith, KCP (1977)
Humour and The Theory of Psychological Reversals
in Chapman, AG and Foot, HC (eds)
It's a Funny Thing, Humour
Oxford: Pergamon

Apter, MJ and Smith, KCP (1979)
'Psychological Reversals - Some New Perspectives on the
Family and Family Communication'
Family Therapy. Vol 6(2), pp.89 - 100

Apter, MJ and Smith, KCP (1978)
Sexual Dysfunction - Depression, Anxiety and Reversal
Theory Parts 1 and 2
British Journal of Sexual Medicine
Vol. 5(38), pp. 23 - 24 and 5(39) pp.25 - 26

Argyle, M and Robinson, P (1962)
Two Origins of Achievement Motivation
British Journal of Social and Clinical Psychology
Vol. 1(2), pp.107-120

Arieti, S (1959)
'Schizophrenia'
in Arieti, S (ed)
American Handbook of Psychiatry (Vol.1)
NY : Basic Books

Beck, AT (1967)
Depression : Clinical, Experimental and Theoretical Aspects
NY : Harper and Row

Beer, S (1959)
Cybernetics and Management
London : English Universities Press

Blackmore, M and Murgatroyd, S (1980)
Anne - The Disruptive Infant
in Murgatroyd, S (ed)
Helping the Troubled Child - Interprofessional Case Studies
London : Harper and Row

Brandon, S (1970)
'Crisis Theory and Possibilities of Therapeutic Interventions'
British Journal of Psychiatry, Vol. 117, pp. 627 - 653

Brown, FG (1976)
Principles of Educational and Psychological Testing
NY: Holt, Rinehart and Winston

Buhler, C (1960)
Psychologie im Leben Unserer Zeit
Munich : Knapf

Buhler, C (1959)
'Theoretical Observations About Lifes Basic Tendencies'
American Journal of Psychotherapy
Vol. 13, pp. 561-581

Campbell, DT and Fiske, DW (1959)
Convergent and Discriminant Validation by the Multitrait-
Multimethod Matrix
Psychological Bulletin, Vol. 56, pp. 81 - 105

Campbell, DTA (1957)
A Typology of Tasks, Projective and Otherwise
Journal of Consulting Psychology
Vol. 21, pp. 207 - 210

Caplan, G (1964)
Principles of Preventive Psychiatry
London : Tavistock

Cattell, RB (1973)
A Comparison of Item and Parcel Factoring on Four Studies
Advanced Publications No. 42
Boulder, Colorado : Institute for Research on Morality and Adjustment

Cattell, RB (1946)
Description and Measurement of Personality
London : Harrap

Cattell, RB, Eber, HW and Tatsuoka, M (1970)
Handbook of the Sixteen Personality Factor Questionnaire
Illinois : Institute of Personality and Ability Testing

Cattell, RB, Horn, JL and Sweeney, AB (1970)
Motivation Analysis Test
Illinois : IPAT

Cattell, RB (1973)
Personality and Mood by Questionnaire
NY : Jossey-Bass

Cattell, RB and Kline, P (1977)
The Scientific Analysis of Personality and Motivation
London: Academic Press

Cowell, MD and Entwistle, NJ (1971)
Relationships Between Personality, Study Attitudes and Academic
Performance in a Technical College
British Journal of Educational Psychology
Vol. 41, pp.85 - 90

Cronbach, LJ (1960)
Essentials of Psychological Testing
NY: Harper and Row (2nd Edition)

Cronbach, LJ (1971)
Test Validation
in Thorndike, RL (ed) : Educational Measurement
Washington, DC : American Council on Education

Ebel, RL (1961)
Must all Tests Be Valid?
American Psychologist
Vol. 16, pp. 640-647

Entwistle, NJ and Cunningham, S (1968)
Neuroticism and School Attainment : A Linear Relationship
British Journal of Educational Psychology
Vol.38, pp.123-132

Entwistle, NJ and Entwistle, D (1976)
The Relationship Between Personality, Study Methods and
Academic Performance
British Journal of Educational Psychology
Vol. 40, pp. 132 - 143

Eysenck, HJ (1967)
The Biological Basis of Personality
Springfield, IU : CC Thomas

Eysenck, HJ, (1977)
Personality and Attainment : An Application of Psychological
Principle to Educational Objectives
Higher Education Review
Vol. 1, pp. 39 - 52

Eysenck, HJ and Cookson, D (1969)
Personality and Primary School Children
British Journal of Educational Psychology
Vol. 39, pp.109 - 122

Eysenck, HJ and Eysenck, SBG (1969)
Personality Structure and Measurement
London : Routledge and Keegan Paul

Eysenck, HJ (1972)
Psychology is About People
London : Allan Lane

Eysenck, HJ and Eysenck, SBG (1976)
Psychopathy, Personality and Genetics
London : John Wiley and Son

Eysenck, HJ (1952)
The Scientific Study of Personality
London : Routledge and Keegan Paul

Eysenck, HJ (1958)
A Short Questionnaire Measurement of Two Dimensions
of Personality
Journal of Applied Psychology
Vol. 42, pp.14 - 17

Farley, FH and Goh, DS (1976)
Penmanship : Faking the P-E-N
British Journal of Social and Clinical Psychology
Vol. 15 (2), pp.139 - 149

Fontana, D (1978)
An Investigation of Reversals and Obsessionality
Unpublished PhD Thesis, University of Wales

Fontana, D (1981)
Obsessionality and Reversal Theory
British Journal of Clinical Psychology
Vol. 20, pp. 299 - 300

Flynn, JP, MacLeon, PD and Kim, C (1961)
Effects of Hippocampol Afterdischarges on Conditoned Responses
in Sheer, DE (ed) : Electrical Stimulation in the Brain
Austin : University of Texas Press

Fransella, F and Bannister, D (1977)
A Manual of Repertory Grid Technique
London : Academic Press

Frankl, VE (1969)
The Will to Meaning - Foundations and Applications of Logotherapy
New York : Plume

Guilford, JP and Frutcher, B (1977)
Fundamental Statistics in Psychology and Education
Tokyo : McGraw Hill (5th Edition)

Hill, LB (1958)
On being rather than doing in psychotherapy
Int. J of Group Therapy
Vol. 8(2) pp. 115 - 122

Hall, AD (1962)
A Methodology of Systems Engineering
Holland : Von Nostrand

Harlow, HF (1953)
Motivation on a Factor in The Acquisition of New Responses
in Vones, MR (ed) Current Theory and Research in Motivation : A Symposium
Lincoln, Nebraska : University of Nebraska Press

Harman, HH (1976)
Modern Factor Analysis
Chicago : University of Chicago Press (3rd Edition)

Hathaway, SR and McKinley, JC (1942)
A Multiphasic Personality Schedule
Journal of Psychology
Vol. 14, pp. 73 - 84

Heim, A, Watts, KP and Simmonds, V (1980)
AH4, AH5 and AH6 Tests
Windsor : NFER

Holtzman, WH and Brown, WF (1968)
Evaluating Study Habits and Attitudes of High School Students
Journal of Educational Psychology
Vol. 59, pp. 404 - 409

Hull, CL (1943)
Principles of Behaviour
New Haven : Yale University Press

Izard, C and Tomkins, SS (1966)
Affect and Behaviour : Anxiety As a Negative Effect
in Spielberger, CD (ed) : Anxiety and Behaviour
NY : Academic Press, pp. 81 - 125

Jenkins, CD, Rosenam, RH and Zyzansk, SJ (1974)
Prediction of Clinical Coronary Heart Disease By A
Test for The Coronary Prone Behaviour Pattern
New English Journal of Medicine
Vol. 290, pp. 1271 - 1275

Kline, P ed (1973)
New Approaches to Psychological Measurement
Chichester : John Wiley & Son

Kline, P (1967)
Obsessional Traits and Emotional Instability in a Normal Population
British Journal of Medical Psychology,
Vol. 40, pp. 153 - 157

Kline, P (1976)
Personality Theories and Dimensions (Block 2)
Milton Keynes : The Open University Press

Kuhn, MH and McPartland, TS (1954)
An Empirical Investigation of Self Attitudes
American Sociological Review
Vol. 19, pp. 68 - 67

Lynn, R (1979)
The Social Ecology of Intelligence in the British Isles
British Journal of Social and Clinical Psychology
Vol. 18, pp. 1 - 12

McKennell, A (1970)
Attitude Measurement - Use of Coefficient Alpha with Cluster
or Factor Analysis
Sociology, Vol. 4, pp. 227 - 245

Mardia, KV, Kent, JT and Bibby, J (1979)
Multivariate Analysis
London : Academic Press

Maslow, AH (1954, 1970)
Motivation and Personality
NY : Harper and Row (1st and 2nd Editions)

Meddis, R (1975)
Statistical Handbook for Non-Statisticians
London : McGraw Hill

Menninger, K, Mayman, M and Pruyser, P (1963)
The Vital Balance
NY : Viking Press

Mowrer, OH (1960)
Learning Theory and Behaviour
NY : John Wiley & Son

Murgatroyd, S (1981)
Reversal Theory ; A New Perspective on Crisis Counselling
British Journal of Guidance and Counselling
Vol. 9(2), pp. 180 - 193

Murgatroyd, S, Rushton, C, Apter, MJ and Ray, C (1978)
The Development of the Telic Dominance Scale
Journal of Personality Assessment
Vol. 42(5), pp. 519 - 528

Murray, H (1962)
'The Personality and Career of Satan'
Journal of Social Issue
Vol. 18, pp. 36 - 54

Pribram, K (1964)
Neurological Notes on Education
in Hilgard, ER and Richey, HG (eds) :
Theories of Learning and Instruction (Part One) : 63rd Yearbook
of the National Society for The Study of Education
Chicago : University of Chicago Press

Robinson, P (1961)
The Measurement of Achievement Motivation
Unpublished doctoral dissertation,
University of Oxford

Sandler, J and Hazari, A (1960)
The Obsessional - On The Psychological Classification of Obsessional
Characteristics and Symptoms
British Journal of Medical Psychology
Vol. 33, pp.113 - 122

Smith, KCP and Apter MJ (1975)
A Theory of Psychological Reversals
Chippenhams : Picton Press

Snaith, BP, Bridge, GWK and Hamilton, M (1976)
The Leeds Scale for the Self-Assessment of Anxiety and Depression
British Journal of Psychiatry
Vol. 128, pp. 156 - 165

Snygg, D and Coombs, AW (1949)
Individual Behaviour - A New Frame of Reference for Psychology
NY : Harper & Row

Stephenson, W (1953)
The Study of Behaviour
Chicago : University of Chicago Press

Stroop, JR (1935)
Studies of Interference in Serial Verbal Reactions
Journal of Experimental Psychology
Vol. 18, pp. 643 - 662

Svebak, S (1982)

The Significance of Motivation for Task Induced Tonic Physiological Changes
Unpublished D.Philos, University of Bergen

Svebak, S, Dalen, K and Storffjell, O (1981)

The Psychological Significance of Task-Induced Tonic Changes in Somatic and Autonomic Changes
Psychophysiology, Vol. 18, pp. 403 - 409

Svebak, S and Murgatroyd, S (in press)

Meta-Motivational Dominance - A Multi-Method Validation of Reversal Theory Constructs
Journal of Personality and Social Psychology
in press (Presented here as Appendix 4)

Svebak, S, Storffjell and Dalen, K (1982)

The Effect of a Threatening Context Upon Motivation and Task-Induced Physiological Changes
British Journal of Psychology
Vol. 73(4), pp. 505-512

Svebak, S and Stoyva, J (1980)

High Arousal Can Be Pleasant and Exciting - The Theory of Psychological Reversals
Biofeedback and Self Regulation
Vol. 5(4), pp. 6 - 7

Thines, G (1977)

Phenomenology and the Science of Behaviour
London : George Allen and Unwin

Thurstone, LL (1947)

Multiple Factor Analysis. A Development and Expansion of the Factors of the Mind
Chicago : University of Chicago Press

Trippi, RR, and Settle, RB (1976)

A Nonparametric Coefficient of Internal Consistency
Multivariate Behavioural Research (Oct)
Vol.26, pp.419 - 424

Van der Geer, JP (1971)

Introduction to Multivariate Analysis for the Social Scientist
San Francisco : Freeman and Co.

Vando, A (1974)
The Development of the R-A Scale. A Paper and Pencil Measure
of Pain Tolerance
Personality and Social Psychology Bulletin
Vol. 1, pp. 28 - 29

Vernon, PE (1964)
Personality Assessment ; A Critical Survey
London : Methuen

Von Bertalanaffy, L (1968)
General Systems Theory
London : Penguin (British Edition)

Wilson, WC and Abelson, HI (1973)
Experience with and Attitude Towards Sexual materials
Journal of Social Issues
Vol. 29(3), pp.19 - 39

Woolfe, R and Murgatroyd, S (1979)
The Open University and the Negotiation of Knowledge
Higher Education Review
Vol. 11(2), pp. 9 - 16

Zuckerman, M (1974)
The Sensation Seeking Motive
in Maher, B (ed) Progress in Experimental Personality Research, Vol.7
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APPENDICES

1. 69 Item Original Instrument
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3. Classification of Employment Used by
The Open University
4. Svebak, S and Murgatroyd, S (in press) :
Meta Motivational Dominance : A Multi-Method
Validation of Reversal Theory Constructs
Journal of Personality and Social Psychology
5. Murgatroyd, S, Rushton, C, Apter, MJ and Ray, C (1978) :
The Development of the Telic Dominance Scale.
Journal of Personality Assessment

APPENDIX ONE

69 ITEM REVERSALS INVENTORY

If you had a choice, which of the following alternatives would you usually prefer, or which most nearly applies to you? Please complete all the items by placing a tick (✓) in column A or B - and only if you really cannot make a choice, in the column headed "Not Sure".

A	B	Not Sure
1. Work activities	Leisure activities	
2. Studying	Doing nothing	
3. Going to an evening meeting	Watching television	
4. Organising a game	Playing a game	
5. Refereeing a game	Watching a game	
6. Driving a car on a long journey	Driving fast for fun	
7. Betting on the favourite	Betting on the outsider	
8. Planning a holiday	Being on holiday	
9. Winning a game	Playing for fun	
10. Saving money	Gambling money	
11. Organising meetings	Throwing a party	
12. Arguing with others to change their opinions	Arguing for fun	
13. Planning ahead	Taking each day as it comes	
14. Work that earns promotion	Work you enjoy doing	
15. Going through life safely	Taking risks	
16. Security in a pensionable job	Making money in an insecure job	
17. Having a steady safe job	Setting up a business with little capital	

18. Going to an evening class to improve qualifications	Going to an evening class for fun
19. Working hard to get on	Enjoying life
20. Working to achieve a major goal	Taking short cuts in the hope of a quick reward
21. Investing money	Speculating money
22. Fixing long-term ambitions	Living life as it comes
23. Having purposes for behaviour	Not needing to explain behaviour
24. Leisure for a purpose	Leisure for excitement
25. Going to an art gallery or museum to learn about the exhibits	..to enjoy exhibits
26. Steady routine in life	Continual unexpectedness
27. Seldom doing things for kicks	Often doing things for kicks
28. Taking life seriously	Treating life light-heartedly
29. Eating special things because they are good for health	Eating special things because you enjoy them
30. Planning leisure	Being spontaneous
31. Winning a game easily	Playing a game with close scores
32. Having tasks set for you	Choosing your own activities
33. Things getting better all the time	Being happy with things as they are
34. Quiet colours	Bright colours
35. Bland flavours	Strong flavours
36. Watching documentaries	Watching a comedy show
37. Listening to serious music	Hearing light music
38. Owning objects d'art	Looking at them in someone's collection

39. Spending most of life in one place

40. Having continuity in the place you live

41. Staying in one job

42. Taking holidays in the same place

43. Always eating familiar food

44. Taking music seriously

45. Working in the garden

46. Building a boat

47. Ignoring one arm bandits

48. Playing games of skill

49. Playing chess/draughts

50. Always having to be busy

51. Reading biography

52. Your team winning a championship

53. Working in one office or workshop

54. Watching a crucial match between ordinary sides

55. Shopping to get value for

56. Careful budgetting

57. Serious minded friends

58. Carefully chosen friends

59. Deep interpersonal relationships

60. Growing vegetables to eat

Spending life in many different places

Having frequent moves of house

Having many changes of job

Taking holidays in many different places

Trying strange foods

Just enjoying music

Picking wild fruit

Sailing a boat

Enjoying one arm bandits

Playing games of chance

Playing dice games

Happy to waste time

Looking at pictures in a book

Your team playing in a championship

Travelling a great deal in one's job

Watching an exhibition game with star performers

Impulse buying

Casual buying

Bar acquaintances

Casual friends

Shallow relationships

Growing flowers to decorate the house

61.Watching a good play at the theatre

62.Reading for information

63.Spending £50 on repaying a loan

64.Exploring a new area for scientific reasons

65.Investing money in a long-term pension fund

66.Climbing a mountain to save someone

67.Ging away on holiday for 2 weeks

68.Compiling a dictionary for financial reward

69.Economising on food

Watching pantomime

Reading for fun

Having an enjoyable week-end

...for excitement

Buying an expensive car

Climbing for pleasure

Spending 2 weeks on a needed home improvement

Writing a short story for fun

Eating a large meal from time to time

Confidential

THE TELIC DOMINANCE SCALE (TDS)

FORM A2

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NAME SEX

OCCUPATION AGE

Instructions

Here are some alternative choices. If you have an open choice, which of the following alternatives would you usually prefer. Please complete **all** the items by putting a cross in the circle corresponding to your choice, making **one** choice for each numbered item. Only if you are not able to make a choice should you put a cross in the circle corresponding to 'Not sure'. Try to answer all of the items by putting a cross in one of the circles for each item, using the 'Not sure' choice as little as you can. Work quickly and do not spend too much time on any one item: it is your first reaction we want.

Now turn over the page and start. This is not a test of intelligence or ability and there are no right or wrong answers.

For further information
about this scale,
contact:

Dr. M.J. Apter,
Psychology Department,
University College, Cardiff,
P.O. Box 78,
Cardiff CF1 1XL,
Wales, U.K.

Do not write in this space

S = P = A =

Total:

1. Compile a short dictionary for financial reward ☐
Write a short story for fun ☐
Not sure ☐

2. Going to evening class to improve your qualifications ☐
Going to evening class for fun ☐
Not sure ☐

3. Leisure activities which are just exciting ☐
Leisure activities which have a purpose ☐
Not sure ☐

4. Improving a sporting skill by playing a game ☐
Improving it through systematic practice ☐
Not sure ☐

5. Spending one's life in many different places ☐
Spending most of one's life in one place ☐
Not sure ☐

6. Work that earns promotion ☐
Work that you enjoy doing ☐
Not sure ☐

7. Planning your leisure ☐
Doing things on the spur of the moment ☐
Not sure ☐

8. Going to formal evening meetings ☐
Watching television for entertainment ☐
Not sure ☐

9. Having your tasks set for you ☐
Choosing your own activities ☐
Not sure ☐

10. Investing money in a long term insurance/
pension scheme ☐
Buying an expensive car ☐
Not sure ☐

11. Staying in one job ☐
Having many changes of job ☐
Not sure ☐

12. Seldom doing things "for kicks" ☐
Often doing things "for kicks" ☐
Not sure ☐

13. Going to a party ☐
Going to a meeting ☐
Not sure ☐

14. Leisure activities ☐
Work activities ☐
Not sure ☐

15. Taking holidays in many different places ☐
Taking holidays always in the same place ☐
Not sure ☐

16. Going away on holiday for two weeks ☐
Given two weeks of free time finishing a
needed improvement at home ☐
Not sure ☐

17. Taking life seriously ☐
- Treating life light-heartedly ☐
- Not sure ☐
18. Frequently trying strange foods ☐
- Always eating familiar foods ☐
- Not sure ☐
19. Recounting an incident accurately ☐
- Exaggerating for effect ☐
- Not sure ☐
20. Spending £100 having an enjoyable weekend . ☐
- Spending £100 on repaying a loan ☐
- Not sure ☐
21. Having continuity in the place where you live . ☐
- Having frequent moves of house ☐
- Not sure ☐
22. Going to an art gallery to enjoy the exhibits . ☐
- To learn about the exhibits ☐
- Not sure ☐
23. Watching a game ☐
- Refereeing a game ☐
- Not sure ☐
24. Eating special things because you enjoy them . ☐
- Eating special things because they are good for
 your health ☐
- Not sure ☐

25. Fixing long-term life ambitions ☐
- Living life as it comes ☐
- Not sure ☐
26. Always trying to finish your work before you
 enjoy yourself ☐
- Frequently going out for enjoyment before all
 your work is finished ☐
- Not sure ☐
27. Not needing to explain your behaviour ☐
- Having purposes for your behaviour ☐
- Not sure ☐
28. Climbing a mountain to try to save someone . ☐
- Climbing a mountain for pleasure ☐
- Not sure ☐
29. Happy to waste time ☐
- Always having to be busy ☐
- Not sure ☐
30. Taking risks ☐
- Going through life safely ☐
- Not sure ☐
31. Watching a crucial match between two ordinary
 sides ☐
- Watching an exhibition game with star
 performers ☐
- Not sure ☐

Playing a game ☐
Organising a game ☐
Not sure ☐

Flipping at pictures in a book ☐
Reading a biography ☐
Not sure ☐

Winning a game easily ☐
Playing a game with the scores very close ☐
Not sure ☐

Steady routine in life ☐
Continual unexpectedness or surprise ☐
Not sure ☐

Working in the garden ☐
Picking wild fruit ☐
Not sure ☐

Reading for information ☐
Reading for fun ☐
Not sure ☐

Arguing for fun ☐
Arguing with others seriously to change their
opinions, ☐
Not sure ☐

Winning a game ☐
Playing the game for fun ☐
Not sure ☐

40. Travelling a great deal in one's job ☐
Working in one office or workshop ☐
Not sure ☐

41. Planning ahead ☐
Taking each day as it comes ☐
Not sure ☐

42. Planning a holiday ☐
Being on holiday ☐
Not sure ☐

PLEASE MAKE SURE
YOU HAVE ANSWERED ALL THE QUESTIONS

Occupational and educational codes for your application form

On the application form we ask you to give information about your occupation and your educational background. This will be treated as confidential. Some of this information is needed for your application and some to help plan the University's future development. You can help us by using the codes given below when you fill in your application form. If you change your occupation before you begin your studies, please let us know the new occupation code so that we can amend our records.

OCCUPATION CODES

Please code your occupation from the groups below when answering question A6.

- 01A Full-time housewives**
Engaged on unpaid domestic duties and no paid part-time work.
- 01B Housewives with paid part-time jobs**
Engaged on unpaid domestic duties but in paid part-time employment for up to twenty hours a week.
- 02 Armed forces**
British and foreign.
- 03 Administrators and managers**
Central government, local government – administrative grades, nationalised industries and private industry.
- 04A Teachers in nursery and primary schools**
In nursery, primary, middle, deemed primary, and preparatory schools.
- 04B Teachers in secondary schools**
In secondary and middle, deemed secondary, schools, sixth-form colleges etc.
- 04C Teachers in further, higher or adult education**
In further education colleges, colleges of education, polytechnics, universities, etc.
- 04D Other teachers, instructors, educational advisers, etc.**
Training officers, technical instructors, apprenticeship supervisors, educational advisers (not driving instructors).
- 05A Medical and health-related professions**
Doctors, dentists, pharmacists, nurses, opticians, radiographers, occupational therapists, public health inspectors, etc.
- 05B Social welfare and personal social services**
Social workers, probation officers, NSPCC officers, community development officers, etc.
- 05C Other professions and arts**
Authors, journalists, actors, musicians, artists, producers. Advertising, public relations, market research. Accountants, company secretaries, lawyers, clergy. Architects, surveyors, town planners. Librarians.
- 06 Qualified scientists and engineers**
Chemical, physical and biological scientists. Chartered engineers – civil, structural, mechanical, electrical, electronic, aeronautical, production, mining and work-study engineers etc.
- 07 Technical personnel: including data processing, draughtsmen and technicians**
Draughtsmen, lab assistants, technicians. Systems analysts, computer programmers, time and motion, O & M. Scientific, technical, engineering assistants and related workers.
- 08 Electrical, electronic, metal and machines, engineering and allied trades**
Electricians, electrical and electronic fitters and assemblers. Plumbers, welders, fitters, sheet metal workers, metal workers, machine toolsetters and operators, mechanics, toolmakers.
- 09 Farming, mining, construction and other manufacturing**
Farmers, forestry and fishermen, miners, quarrymen. Gas, coke and chemicals, glass and ceramics, furnace, forge, foundry and rolling mills, woodworkers, leather, textiles, clothing. Food, drink, tobacco, paper and printing. Builders, bricklayers, plasterers, painters. Warehousemen, packers, labourers etc.
- 10 Communications and transport: air, sea, road and rail**
Drivers, railwaymen, porters, seamen, boatmen, pilots, navigators, traffic controllers, bus conductors, dockers. Telephonists, telegraph operators, postmen, messengers.
- 11 Clerical and office staff**
Typists, secretaries, clerks, cashiers, office machine operators, computer operators. Central and local government, all executive and clerical grades.
- 12 Shopkeepers, sales, services, sport and recreation workers, fire brigade and police**
Shop proprietors and managers, assistants, salesmen, travellers, insurance brokers, auctioneers, valuers, undertakers. Hotel and restaurant owners and workers, publicans, barmen, waiters, cooks, maids, cleaners. Chimney sweeps, caretakers. Hairdressers, laundries, garages, roundsmen. Hospital orderlies, ambulance men. Athletes, models, photographers.
- 13 Retired, independent means, not working (other than housewives), students.**
- 14 In institutions, e.g. prison, chronic sick etc. (not including staff in institutions)**

EDUCATION CODES

Please examine this list and answer question D2 on your application form with the appropriate code for the highest level of qualification that you hold.

- A** No formal educational qualifications
- B** CSE (other than grade 1), RSA, or school leaving certificate
- C** CSE grade 1, GCE O level, SCE O grade, school certificate or equivalent, BEC general certificate and diploma, SEN
- D** GCE A level, SCE H grade, higher school certificate or equivalent, SRN certificate
- E** ONC/OND, BEC national certificates or diplomas, TEC certificates and diplomas
- F** HNC/HND, BEC higher national certificates and diplomas, TEC higher certificate and higher diplomas
- G** Teachers certificates or equivalent
- H** University diploma or equivalent based on at least one year's full-time study (includes diploma in higher education)
- J** First degree of CNA or university
- K** Postgraduate degree

APPENDIX 4

Dr Philos Sven Svebak and Mr Stephen Murgatroyd

Meta-Motivational Dominance :

A Multi-Method Validation of Reversal Theory Constructs

Journal of Personality and Social Psychology
(in press)

Stephen Murgatroyd collaborated fully in this experiment. He conducted the interviews described on Pages 13 - 19 and is a full co-author of all sections of the paper.

Abstract

The theory of psychological reversals postulates dominance in relation to telic (seriousminded, planning oriented, arousal avoiding) and paratelic (playful, here and now oriented, arousal seeking) states as discriminatory features of personality. The term "seriousmindedness" includes an orientation towards future goals which the individual, in that dominant state, regards as being essential. Reversal theory further proposes that dominance is characterized both by biological and psychological differences which have bearing upon the person's life style and planning abilities. 110 subjects completed a measure of dominance (the Telic Dominance Scale) from which 10 telic and 10 paratelic subjects were extracted as representatives of extremely dominant groups according to a long-term perspective on goal-directed behavior patterns. Each subject completed a continuous perceptual-motor task in a psychophysiological approach to goal-directed behavior in a particular experimental situation. In addition, a sub-sample (6 telic and 6 paratelic) participated in a structured interview on goal-directed life style throughout a particular working day. Taken together, the data obtained from survey, experiment, and interview gave strong construct validity support to the telic and paratelic constructs outlined in reversal theory. Physiological group differences were due to steeper electromyographic activity gradients, higher tonic skin conductance, and greater thoracic respiratory amplitudes in the telic than in the paratelic subjects.

Meta-motivational dominance: A multi-method validation of reversal theory constructs

INTRODUCTION

The theory of psychological reversals offers a structural interpretation of certain psychological processes (Apter, 1979; Apter, 1981; Smith and Apter, 1975). In particular, reversal theory offers an explanation of the ways in which meta-motivational dominance (the characteristic ways in which a person interprets their own motives and intentions) acts as a determinant for action and behavior.

Reversal theory stands in the tradition of action theories (see Gauld and Shotter, 1977; Harré and Secord, 1972; Shotter, 1975) in that it is concerned with understanding human action by reference to the motives people have for their action, not just with their behaviors. Unlike other action theories, such as scheme theory (Eckblad, 1981) or attribution theory (Shaver, 1976), reversal theory is concerned with the deep structure of motivation and not simply the surface structure of motives (see Chomsky, 1965). A main tenet of reversal theory is that a person can perform grossly similar behaviors on different occasions but have different meta-motives for doing so. A person may drive a car at a very fast speed on one occasion in order to arrive on time at an important meeting; on another occasion their fast driving reflects their search for arousal and pleasure: The grossly similar behaviors performed on two occasions involves different motivational states. To understand behavior it is necessary to understand motives by reference to meta-motives.

If this were its only contribution to psychology, reversal theory would be offering little of any value. However, reversal theory suggests a structural

analysis of both motives and the ways in which individuals utilize motives. First, the theory suggests that individuals display a propensity for bi-stability of meta motives. At some time the individual is motivated by a desire to achieve goals which they feel to be both externally imposed and essential; they seek to complete activities so as to obtain satisfaction from achieving their goal; they engage in carefully planned activities so as to achieve their goals; they seek to minimise their felt level of arousal and pay little attention to the emotional content of their actions whilst engaged in goal-directed behavior. This meta-motivational state is referred to as the telic state, from the Greek "telos" meaning goal or end. On other occasions individuals experience their motives within the context of a different meta-motivational state: They do not perceive essential goals for the behavior they engage in; they feel directed by their emotional experience of pleasure in the "here and now"; they seek to prolong activities so long as they are producing high levels of felt arousal which is experienced as pleasurable; spontaneity is preferred to planning, and high arousal is preferred. This second meta-motivational state is referred to as the paratelic state. Full description of these states are given in Apter (1982). Reversal theory is unique in suggesting that individuals will reverse between these two states or modes of information processing and that such reversals is related to a number of psychological conditions, namely satiation, contingency and frustration. Furthermore, whilst individuals reverse between these two states with some structural regularity, reversal theory suggests that some individuals will be dominated most of the time by one of the states. Thus, a telic dominant person will spend only some of his/her time behaving in a paratelic state and not feel this to be incongruous. Similarly, a paratelic dominant person will spend time behaving in a telic state and not feel this to be incongruous. In this context, then, dominance becomes a probabilistic concept (related to the more traditional trait concept) suggesting the maximum-likelihood

of a person being in one state rather than another at a given time. The telic-paratelic pair of states are just one pair of states which display these structural qualities. More recent writings on reversal theory document other such pairs, most notably the negativism--conformity pair (Apter, 1982; Apter and Smith, 1976).

Other studies have examined the value of reversal theory in relation to obsessionality (Fontana, 1981), colour-preference and felt arousal (Walters, Apter and Svebak, 1982); humour (Apter and Smith, 1977; Svebak, 1982); counselling and therapy (Blackmore and Murgatroyd, 1980; Murgatroyd, 1981) and coronary-prone behavior (Svebak, 1983a). Most of these studies have made extensive use of the Telic Dominance Scale (TDS) developed by Murgatroyd, Rushton, Apter, and Ray (1978); a scale which measures the dominance of subjects in relation to telic and paratelic states (see also Apter, 1982).

In this paper we wish to examine the nature of telic and paratelic dominance. In particular, we wish to examine the extent to which this dominance have physiological correlates as well as meaning in terms of descriptions of everyday life. Using survey, experiment and interview data we wish to examine the hypothesis that telic dominant subjects differ significantly in their psychophysiology and psychology from paratelic dominant subjects.

Psychophysiological data are already at hand which suggest differences between telic versus paratelic dominance for task-induced muscle tension patterns (Svebak, 1983b; Svebak, Storfjell, and Dalen, 1982). These data consistently reflect a build-up of muscle tension over the course of task performance (a gradient) in muscles not strictly involved in the performance of the actual task. Such gradients have been derived from experiments using the continuous perceptual-motor task paradigm first applied by some of the pioneers of activation theory (Malmo, 1965). It was hypothesized by Malmo (1965, 1975) that task-induced physiological gradients were due to a goal-directed behavioral sequence performed according to a plan which controls the sequence of

operations needed to achieve the goal. Malmö (1965) made reference to hierarchical structures in the central nervous system to elucidate the nature of his concept of planned performance. Planning orientation has been adopted as one of the defining features of a distinction between the telic versus paratelic meta-motivational states outlined above. On the basis of recent research (Svebak, 1983b), it was hypothesized that task-induced muscle tension gradients occur in the telic dominant subject and that such gradients will not occur in paratelic dominant subjects during the performance of identical tasks. In the present experiment, measures of passive forearm flexor electromyographic activity (EMG) were derived to test this hypothesis, and measures of skin conductance level (SCL) and respiration were included for exploratory purposes.

In relation to the interview data collected here, two hypotheses can be advanced for reversal theory. First, when asked to provide descriptions, telic subjects would provide detailed, realistic and relatively non-evaluative statements; in contrast, paratelic subjects would offer descriptions which contain many sequential and descriptive gaps, they would make far more use of fantasy and evaluative comments and be less reliable (see Apter, 1982, esp. at p. 52). Second, the content of experience described by subjects would differ; telic subjects would give emphasis to goal-directed and planned activity whilst paratelic subjects would emphasise here and now focussed activity and arousal seeking. These hypotheses can be tested by reference both to content of descriptions and to the grammar of the descriptions obtained through interviews.

Further, we wish to document the consistency of both physiological and state measures as probabilistic descriptors of dominance and the relationships between these transient measures and the persons dominance as indicated both by the survey and interview data. In short, we wish to offer a construct validity study of telic and paratelic dominance.

Before describing the study to be reported here in detail, some comments about methodology are necessary, since the theory of reversals presents especial problems for the design of research studies. Reversal theory is essentially a structural-phenomenological theory of human action (Apter, 1982). Whilst dominance can be measured by using a psychometric trait measure (Murgatroyd et al., 1978) the measurement of states is also necessary if a study is to have meaning in the context of the theory. Svebak and Apter have developed some state measures for the telic and paratelic states which have been used in experimental studies (Svebak, 1983b; Svebak et al., 1982). The measurement of states is a notoriously difficult problem. Adjective check-lists, self-rating scales, and scales such as the ones used in this study are at best approximations of the persons state experience. But reversal theory requires the collection of state data since a person may begin an experiment in a state other than that which their dominance may suggest and they may reverse from one meta-motivational state to its opposite during the course of an experiment. Indeed, reversal theory presents the researcher with an especially good case for the use of triangulation methods both to track states and to fully explore both the behavior, motives and meta-motives of the person engaged in any study.

This study investigated the psychophysiology of goal-directed behavior according to a distinction between telic versus paratelic dominance. Subjects were recruited by the use of a survey measure on such dominance. A semi-structured interview asked for data on behavior patterns throughout one particular day (i.e., "yesterday"), and responses to a state measure reflected telic/paratelic state during the experiment. Taken together, these measures extended the range of the data to include long-, medium-, and short-term indicators of goal-directed behavior according to the telic-paratelic distinction. It was expected that these measures would substantiate the internal as well as external validity of individual differences in physiological responses during the experiment.

METHOD

1. Subjects (Survey data)

In this study, the TDS was completed by 72 female and 38 male students in introductory psychology courses and their responses were scored according to the criteria given by Murgatroyd et al. (1978). From this sample extreme groups were selected using the seriousminded-playful sub-scale (total range = 1.5 - 11.0; mean 4.65). The telic group consisted of five females and five males (score range 6.0 - 11.0; age range 18-23 years), and the paratelic group counted six females and four males (score range 1.5 - 3.0; age range 20-22 years). From a conceptual perspective, the seriousmindedness sub-scale is the crucial indicator of long-term goal-directed behavior styles. In this respect, therefore, the two subject groups reflected opposite life-styles according to a distinction between seriousmindedness versus playfulness. These 20 subjects volunteered for the psychophysiological experiment and were paid 75 Nkr (\$11) for their participation.

2. Experiment

Apparatus and procedure

All subjects composing the extreme groups described above, one by one in counterbalanced order (group by gender), participated in an experiment performed in an electrically-shielded, soundproof, and climate-controlled subject compartment of a psychophysiological laboratory. The subject was set to perform a task which represented a video car-racing simulation where the subject's car runs at twice the speed of other cars appearing at random positions along the track shown on a television screen. The subject is set the task of avoiding running into other cars by shifting the position of his/her car from one side of the road to the other. This was accomplished by the operation of a play-

-stick held in the right hand (all subjects were right-handed). The task lasted for 150 seconds. The subject was told that the experiment investigated physiological correlates of task performance and that it was essential to make as few "crashes" as possible (see Svebak et al.; 1982).

Surface Ag/AgCl cup electrodes were used for the recording of passive forearm flexor EMG (see Lippold, 1967) and skin conductance level (SCL). For EMG recording, the skin surface was cautiously abraded before electrodes were attached. Adhesive collars and the Beckman electrode paste were used on both sites. The EMG-activity was amplified by an EMG P303 Cyborg unit and displayed on the Cyborg EMG BL900 Dual Processor with 10 seconds integration periods for the 100-1000 Hz band. System noise level for the EMG set-up was less than .18 μ V.

The SCL electrodes were attached to the medial phalanx of the index and long fingers of the passive hand. These sites were cleaned with water, and adhesive collars and the NASA conductive paste were used for recording fluctuations in SCL.

Thoracic respiration was measured by the use of an appropriate (see Svebak, 1975, for details) Hg-gauge strapped around the whole trunk circumference at the level of the armpits. Respiration activity and SCL were recorded by an 8-channel Beckman Dynograph including the Hg-gauge coupler and the constant current coupler respectively.

State Measure

A Telic State Measure (TSM) was completed at the end of task performance, and it was designed to the purpose of documenting the extent to which subjects maintained their dominant state in the experimental situation. This measure, published for the first time in this paper, asked for subjects response to four items:

- (1) Estimate here how playful or serious you felt.
- (2) Estimate here how far you would have preferred to plan ahead or to be spontaneous.
- (3) Estimate here how aroused you actually felt.
- (4) Estimate here the level of arousal you would have liked.

For these items the following instruction was given: "Please note feelings during the period of time indicated by the experimenter (the task performance period), in terms of the four following rating scales. Do this by circling a point corresponding to a number." Six-point scales were used with defining adjectives at each end (playful-serious, preferred spontaneous-preferred planned, low arousal-high arousal, preferred high arousal-preferred low arousal); the latter scoring six in each case. (An item on perceived task difficulty (easy-difficult) was scored by the same format. Note that this latter item should not be included in the TSM because it relates to task-perception, rather than to self-perception.)

The additional instructions were given to the subject about the meaning of items included in the TSM. These instructions are:

- (1). By "serious" here is meant the feeling that you are pursuing (or at least thinking about) some essential goal. For example, the goal may be to achieve something in the future which you believe to be important, or it may be to overcome some real danger or threat in the present.
By "playful" is meant the feeling that you are doing what you are doing for its own sake. In this case your activity is felt to be enjoyable in itself and not to require any further justification. Any goal which there might be is really an excuse for the behavior.
- (2). By "planning ahead" is meant trying to organize your behavior in such a way that it leads effectively to some goal in the (perhaps

distant) future, and being aware of the future consequences of your present actions.

By "spontaneous" is meant that your actions are undertaken on impulse, with little regard for future consequences. Note that this scale asks for your preference at the time in question, rather than your ability to plan or be spontaneous.

- (3). By "arousal" here is meant how "worked up" you feel. You might experience high arousal in one of a variety of ways, for example as excitement or anxiety or anger. Low arousal might also be experienced by you in one of a number of different ways, for example as relaxation or boredom or calmness.
- (4). "Arousal" has the same meaning for this scale as for the previous one. But now the emphasis is on the level of arousal you want rather than the level of arousal which you are actually experiencing.

3. Interview

Following the completion of the experimental task interviews were carried out with each subject under carefully controlled conditions. Each interview was conducted by a skilled interviewer, experienced in counselling and psychotherapy, ignorant of the subjects performance under the experimental conditions. The interviewer was also "blind" to the available TDS data on each subject.

The interviews were brief but structured, All subjects were asked these questions with respect to the day immediately preceeding the interview: (a) "What did you do yesterday?"; (b) "Was this what you planned to do?"; (c) "What was the most exciting feature of your day?" and (d) "What was the most surprising feature of this day?" In respect of the planning-orientation of subjects, each were asked the following question about their intentions for the day immediately following the experiment: (a) "What do you plan to do to-

morrow?"; (b) "What do you think might disrupt these plans?" and (c) "What do you anticipate to be the most exciting event for tomorrow?". The first set of questions, concerned with the previous day, focus upon the life-style of each subject whilst the second set focus upon planning orientation. Each interview took between 11 and 25 minutes and was conducted under identical conditions of heating and lighting in a sound-proofed room different from that used for the experiment. Subjects were assured that the contents of their interview were confidential and that it would not be possible for their identity to be deduced from the reporting of the resultant data.

In all, twelve subjects were interviewed by the same interviewer immediately after the completion of the experimental task. This sub-group of the sample documented above consisted of six telic dominant and six paratelic dominant subjects as defined by their seriousness scores on the TDS. Each of these groups of dominant subjects were matched for gender.

The interviewer, blind to the group allocation of subjects, to their TDS scores and to their performance in the experiment, used interview data alone to classify subjects into telic or paratelic dominant groups. Using the same data-base, the interviewer then ranked subjects as if they constituted a continuous telic-paratelic dimension. In addition, a content and structural analysis of the interviewers verbatim notes was used to explore the phenomenological differences between groups.

4. Data Treatment

For all psychophysiological variables for which data was collected during the experiment, scores were calculated at the end of 30 seconds pre- and post-baseline periods, which the subject spent with closed eyes, and at the end of each successive 30 second period throughout task performance. In all scoring periods, SCL-scores were given as the mean of the levels at the start and end of a 10 second period for EMG-scoring. The thoracic amplitude was scored as

the mean change in thorax circumference throughout three successive inspiration cycles starting five seconds before scoring periods for EMG and SCL. The thoracic amplitude was given as a percentage of the resting trunk circumference to eliminate the effect of individual differences in body size (see Svebak, Dalen & Stor fjell, 1981, for details). Post-baseline scores were excluded from all ANOVAs.

The TSM was scored according to criteria established in other studies: Scores in the range 1-3 for items 1, 2 and 4 are regarded as indicating paratelic state and scores in the range 4-6 are regarded as indicative of telic state. Discrepancies between scores on items 3 and 4 are regarded as a measure of psychological tension (see Apter, 1982, esp. at p. 89). Since psychological tension is not related theoretically or practically to this experimental design these data are here disregarded.

RESULTS

Experimental data

Insert Fig. 1 about here

The results for EMG, SCL, and respiration are presented for each group and for each treatment in fig. 1. Analysis of variance indicated that an overall main effect of groups occurred for the passive forearm flexor EMG-activity ($F(1/18) = 12.11, p < .003$), SCL ($F(1/18) = 4.84, p < .04$), and thoracic amplitude ($F(1/18) = 4.23, p < .05$), telic subjects showing evidence of higher task-irrelevant muscle tension in the passive forearm flexor as well as in the intercostal muscles of the thorax, and higher levels of sympathetic

nervous system activity (SCL) relative to those for the paratelic group. Moreover, for the passive forearm flexor, a main effect of scoring periods was due to high EMG-scores towards the end of task performance ($F(5/90) = 16.49, p < .0001$). In addition, the factors due to groups and scoring periods yielded a significant interaction ($F(5/90) = 3.94, p < .003$), reflecting the fact that task-irrelevant muscle tension increased more over the course of the task for telic subjects than was the case for paratelic subjects. An overall increase in SCL occurred in both groups initially during task performance ($F(5/90) = 11.73, p < .0001$). Thoracic respiration amplitude scores yielded no other effect but that of groups.

It was significant for all group differences in physiological activity that they could not be explained by reference to performance differences: There was no significant group difference in number of simulated car "crashes" in either task (telic group: Mean = 7.7 (std. = 4.22); paratelic group: Mean = 10.6 (std. = 5.78); $F(1/18) = 1.27$). Telic State Measure scores indicated that subjects of both groups maintained their dominant state throughout the experiment. For the playful-serious item, the telic group mean was 3.6 (std. = 1.35), and the paratelic group mean was 2.0 (std. = 0.94) which yielded a significant group difference ($F(1/18) = 9.44, p < .007$). The corresponding scores for the item on planning were: Telic mean = 4.7 (std. = 0.83); paratelic mean = 3.2 (std. = 1.62) with $F(1/18) = 6.82, p < .02$. Group differences for felt level of arousal were not predicted due to the assumption in reversal theory that these groups would differ in their ways of experiencing arousal, rather than in felt levels of arousal as such. Certainly, a group difference for this item was not found ($F(1/18) = 1.20$): Telic mean = 4.4 (std. = 0.97); paratelic mean = 3.8 (std. = 1.03). The assumption that the groups should differ in terms of preferred levels of arousal was not significantly substantiated ($F(1/18) = 2.44$): Telic mean = 3.7 (std. = 0.89), paratelic mean = 4.2 (std. = 0.92). Finally, group differences were not reflected

in scores on perceived task difficulty ($F(1/18) = 1.12$): Telic mean = 2.4 (std. = 0.78); paratelic mean = 2.8 (std. = 0.83).

Interview Data

When the interviewer's allocation to groups was compared with the allocation to groups achieved by the TDS using the Fisher Exact Probability test (Siegel, 1956), it was found that the relationship between these two group allocations was significant ($p < .05$). Furthermore, when the ranking of these same subjects on the seriousmindedness scale of the TDS (this being the basis of their selection as subjects for the experiment), a significant relationship was also detected ($\rho = .56$, $p < .05$). These data suggest that the interviewer was able to detect dominance and to correctly contrast degrees of dominance on the basis of short structural interviews with a relatively high degree of success. That is to say, interviewing does appear to be an effective tool for the accurate classification of dominance. These data also provide strong supporting evidence for the construct validity of the Telic Dominance Scale and for the characteristic features of the telic and paratelic polarities suggested in reversal theory.

The successful classification and ranking of the interview data cannot be attributed to idiosyncratic talents of the actual interviewer. This was documented by a test put upon the ability of others to make such classification and judgements: Transcripts of the interviews were shown to five independent judges who were asked to rank and classify these subjects in a way identical to that of the original interviewer. These judges were familiar with the description of the telic and paratelic states given by Apter (1982, see chapter 3). Inter-judge reliability in relation to both the allocation of subjects to dominance groups ($\rho = .88$) and the ranking of subjects in relation to seriousmindedness ($\rho = .81$) was high. Judges' rankings and allocations also

showed a strong resemblance to that suggested by the ranking and allocations from the seriousmindedness sub-scale of the TDS ($p < .05$) in both cases.

A second objective of the interview procedure concerned the differences between subjects in terms of self-reported life-styles. Verbatim notes of the interviews produce a considerable amount of data, not all of which is to be reproduced here. Rather than summarise data for all subjects, we have elected to present data from the two most extreme subjects as determined by reference to the TDS data. This is because they adequately reflect the difference that emerged in the interviews between subjects in the two groups in terms of life-style.

The first subject was male and, according to both the TDS classification and that offered by the interviewer, was the most telic person to participate in the experimental study. He described his day (i.e. yesterday) as follows:

All of my days go into each other, they look generally the same.

I try to keep them this way. I like to work in routines. I

found in the army, when I was there for one year, that routines let you stay as you are and let you become stronger as you are.

So here's what I did. I got up at 1000, went to the bathroom and washed my hands. Went to the toilet and washed my hands and then had a shower. I brushed my teeth and dried myself carefully.

I went to the gymnasium for some weight-training and other training, but it was closed due to a problem associated with water supply. I could not get my exercise. This upset my routine. I went to the bank to collect my loan and telephone my father to seek his advice about what to do with the money. He told me to send the loan papers to him and he would make the necessary arrangements. I then returned to my flat at 1300, ate an apple and drank a cup of citrus juice--people overeat, I try to look after my figure. People with whom I share my flat have a dog which I

took out for a walk and a jog. I found this exhilarating and exciting. At 1500 I took the dog into town to watch the final part of the student demonstration. The demonstration was about rents-- I do not think such demonstrations achieve their purposes. It is better to find ways of paying your rent. On my return to the flat there was a letter saying that I owed the army 36 crowns for my last phone bill. This was untrue. I had paid my bill. I wrote immediately and jogged to the post office and posted my letter.

At 1700 I watched a TV programme--only for 35 mins. From 1735 to 2100 I worked on my translation of Kretch and Crutchfield. Because my head was so full of this work, which I regard as especially important, I stopped and took a walk to a nearby shop for a very small bar of chocolate. At the shop people were watching Norway versus Sweden at football. It looked interesting and the people in the shop were getting excited, but I had important work to do, so I went back to the flat. I started to work again, but all were watching TV in the room upstairs, cheering whenever a goal was scored. In the end, the noise meant I had to give up and join them in watching the football. Once it was finished I was able to go back and work some more. This I did until 0130 when I went to bed. I slept straight away.

In response to the same question, the paratelic dominant subject (a female) offered the following account:

Yes...er...well...er...I...er...overslept...I hadn't felt...er... very well the day before and I needed to sleep...I just...er...slept in. I got to the reading room at about...er...1000. I was supposed to go to a lecture and...er...two tutorial groups, but I did not bother. Instead I talked to a man who fancies me. I agreed with him that I would go to the picture with him. So I went home and had a shower, washed my hair and sat in a sauna. It was good. I thought about the

man I'd just met. I didn't feel guilty about missing the lectures. I was having a nice time. Also I felt better... At about 1700 I had dinner with the man I told you about. Then my friend came and we decided to help her by driving her out to the airport. It made me a little homesick--she was from my own town and she was going back for a few days... At the airport, I met three others I knew who were going back there too. I had coffee with them. Then the man friend I had met that day took me to see the film "Fame". I enjoyed this film because it changed a lot--lot's of different threads--I liked that. Then we went to his flat and drank tea and played chinese chess. We had sex...then I went home. I think he's serious about me, but I'm not serious about him. I got home at 0200--very tired.

In response to the further questioning about their activities these two subjects continued to display their different approaches to their life-style.¹⁾

These self-reported accounts suggest that the two subjects differed from each other in ways consistent with the conceptual distinction between telic versus paratelic dominance and with their TDS scores on long-term goal-directed behavior styles. First, it is noticeable that there were qualitative differences in their presentation. Whilst one offered a detailed and time-tied account of their day, the other offered a generalised account which highlighted certain key events. Second, the language and grammar used to present these accounts differed. Whilst one provided a descriptive account with occasional evaluations, the other offered an evaluative account with occasional descriptions. A third difference between these two accounts concerned the actual experience they documented. The telic subject (by TDS) engaged in telic behavior and was upset by disruptions to routines or by the insinuation that he was not serious about paying bills. He was reluctant to engage in playful activity (e.g., watching television) without having some rationale external to himself. In contrast, the paratelic subject avoided certain opportunities

to be serious (opportunities which she had planned to take) in favour of social, exciting, and new behaviors. It should be emphasised that the difference between subjects were more than adequate to enable the interviewer and subsequent judges to predict both the group allocation and the ordering of the subjects in terms of the TDS seriousness-score at the 5% level of significance. The differences reflected in the short transcripts referred above do not reflect gender differences; a female telic and a male paratelic might just as well have been chosen as examples, without affecting the validity of these observations in relation to telic versus paratelic dominance.

DISCUSSION

This paper documents the use of three different methods with the same set of subjects to examine the nature of telic versus paratelic dominance within a long-term, medium-term, and short-term time perspective (survey, interview, and experiment) respectively. The use of survey method generated sub-groups of dominantly telic and dominantly paratelic subjects according to a long-term perspective on habitual goal-directed behavior styles; one group being oriented towards future goals which were perceived as being essential, and the other (paratelic) group being playful in the sense of "here and now" orientation. The group distinction, due to TDS scores, was maintained in a short-term approach to goal-directed behavior in a psychophysiological experiment: State measure scores indicated that the groups maintained their dominant state in that particular situation. Moreover, the groups differed significantly on a physiological index of effortful goal-directed behavior first used by some of the pioneers of activation theory (Malmo, 1965): Telic subjects revealed passive forearm flexor electromyographic gradients over the course of task performance which were steeper than those of the paratelic subjects.

Telic subjects also had higher tonic skin conductance and thoracic respiratory amplitudes than had the paratelic subjects. In general, the psychophysiological data suggest that there are biological differences between telic versus paratelic dominant subjects. Partly, the results lend support to the idea that a dominant telic state includes the risk of developing relatively high levels of muscle tension in striate muscles which are not strictly relevant to task demands. It is likely that this risk pertains to a variety of skeletal muscles as indicated here by measures of the passive forearm flexor EMG-activity and the thoracic respiratory amplitudes, the latter being taken as a reflection of an overall group difference in the activity of the intercostal and other muscles of the chest. The SCL results indicated a difference between the two groups in overall sympathetic tone. Therefore, it should be a task for future research to investigate the role of telic versus paratelic dominance in tolerance to acute and prolonged exposure to stress as measured by indicators of sympathetic activation.

Data from the interviews with these same subjects focused on a medium-term time perspective (behavior patterns throughout one particular day). These data indicated that telic dominant subjects and paratelic dominant subjects lead different life-styles which strongly reflect the conceptual distinction made in reversal theory on goal-directed behavior in telic versus paratelic dominant subjects. The interviews also showed that subjects from the two groups accounted for these life-styles in different ways, both in terms of the content and form of the descriptions. So different were these accounts that it was possible for interviewers and independent judges to use brief scripts from these interviews as a basis for statistically significant classifications and ranking of subjects in terms of their degree of dominance. Consequently, these classifications also reflected the group differences obtained in the psychophysiological experiment. In addition, the available interview data clarified marked differences between the two groups in the way in which they

consider the future and plan towards it.

Taken as a whole, the evidence summarized in these last paragraphs offers strong supporting data for the construct validity of a distinction between the telic and paratelic dominant meta-motivational states defined in reversal theory. When taken together with the growing body of empirical research already published (Apter, 1976; Blackmore and Murgatroyd, 1980; Fontana, 1981; Murgatroyd et al., 1978; Svebak, 1983b; Svebak, Storfjell, and Dalen, 1982; Walters, Apter, and Svebak, 1982), the existence of this meta-motivational distinction is clearly established as a determinant for action in terms of general life-style as well as biological response patterns.

A rather different method was used here than usual in that subjects were given extended instructions about the meaning of words used to define the TSM item-scales. The use of extended instructions reflects the documentation of the variety of meanings conveyed by the actual words when used in everyday language (see Apter, 1982, e.g., pp. 60-64 and 86-89). The inclusion of these instructions in future studies may prove to be crucial to the successful replication of the present results. Conversely, the extensive use of adjective check-lists in current research (e.g. on anxiety) typically excludes extended instructions. Conflicting results within this research may reflect the use of ambiguous scales which would have gained in clarity by the use of extended instructions working towards construct identity across individuals.

On the other hand one might question the external validity of experimental findings by suggesting that the subjects were "sensitized" by the TSM and its extended instructions prior to the interview. The power of this objection is limited by the fact that TSM instructions were balanced regarding the telic and paratelic poles for each item. Moreover, a question like "What did you do yesterday?" is hardly biased towards any particular dominant state. From this perspective interviews reflected individual differences in life-style which indicated the external validity of the experimental data.

The TSM-scores on preferred level of arousal reflected the predicted group difference in arousal preference, but they failed to reach statistical significance. This negative result may be due to a possible confusion of preferred level of arousal with hedonic tone when the subjects responded to item 4. The possibility of a confusion at this point was not made part of the extended instruction in order to avoid a bias towards the reversal theory assumption of a state-dependent preference for felt level of arousal.

By and large, the success of the multi-method approach taken in this study of the validity of theoretical constructs could not have been achieved by the use of any one or pair of methods alone. This fact makes a strong argument in favour of a multi-method approach to the future investigation of the psychosomatic and psychopathological implications of the present findings.

Acknowledgements

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Footnote to page 16

1) A more extensive account of the interview data can be obtained from the authors of this paper.

References

- Apter, M. J. Some data inconsistent with the optimal arousal theory of motivation. Perceptual and Motor Skills, 1976, 43, 1209-1210.
- Apter, M. J. Human action and the theory of psychological reversals. In G. Underwood and R. Stevens (Eds.), Aspects of consciousness (Vol. 1). London: Academic Press, 1979. Pp. 45-65.
- Apter, M. J. On the concept of bistability. International Journal of General Systems, 1981, 6, 225-232.
- Apter, M. J. The experience of motivation: The theory of psychological reversals. London: Academic Press, 1982.
- Apter, M. J. and Smith, K. C. P. Negativism in adolescence. The Counsellor, 1976, 23/24, 25-30.
- Apter, M. J. and Smith, K. C. P. Humour and the theory of psychological reversals. In A. J. Chapman and H. C. Foot (Eds.), It's a funny thing, humour, Oxford: Pergamon Press, 1977. Pp. 95-100.
- Blackmore, M. and Murgatroyd, S. Anne: The disruptive infant. In S. Murgatroyd (Ed.), Helping the troubled child: Interprofessional case studies. London: Harper and Row, 1980. Pp. 32-42.
- Chomsky, N. Aspects of the theory of syntax. Cambridge, Mass.: MIT Press, 1965.
- Eckblad, G. Scheme theory. London: Academic Press, 1981.
- Fontana, D. Obsessionality and reversal theory. British Journal of Clinical Psychology, 1981, 20, 299-300.
- Gauld, A. and Shotter, J. Human action and its psychological investigation. London: Routledge and Kegan Paul, 1977.
- Harré, R. and Secord, P. F. The explanation of social behaviour. Oxford: Blackwell, 1972.
- Lippold, O. C. J. Electromyography. In P. H. Venable and I. Martin (Eds.), A manual for psychophysiological methods. Amsterdam: North Holland, 1967. Pp. 245-297.

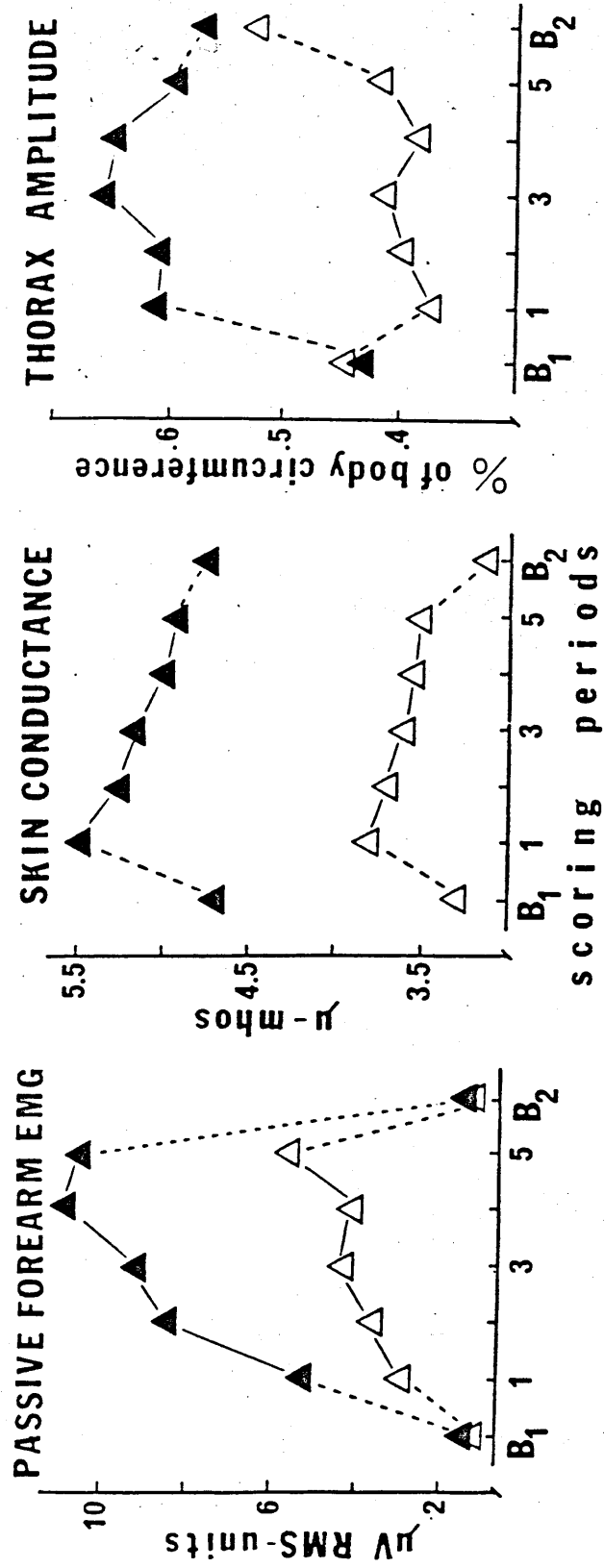
- Malmo, R. B. Physiological gradients and behavior. Psychological Bulletin, 1965, 64, 225-234.
- Malmo, R. B. On emotions, needs, and our archaic brain. New York: Holt, Rinehart, and Winston, 1975.
- Murgatroyd, S., Rushton, C., Apter, M. J. and Ray, C. The development of the Telic Dominance Scale. Journal of Personality Assessment, 1978, 42, 519-528.
- Murgatroyd, S. Reversal theory: A new perspective on crisis counselling. British Journal of Guidance and Counselling, 1981, 9, 180-193.
- Shaver, K. G. An introduction to attribution processes. Cambridge, Mass.: Winthrop, 1976.
- Shotter, H. Images of man in psychological research. London: Methuen, 1975.
- Siegel, S. Nonparametric statistics for the behavioural sciences. New York: McGraw Hill, 1956.
- Smith, K. C. P. and Apter, M. J. A theory of psychological reversals. Chippenham, UK: Picton Press, 1975.
- Svebak, S. Respiratory patterns as predictors of laughter. Psychophysiology, 1975, 12, 62-65.
- Svebak, S. The effect of mirthfulness upon amount of discordant right-left occipital EEG alpha. Motivation and Emotion, 1982, 6, 133-147.
- Svebak, S. Personality and cardiovascular risk. Journal of the Norwegian Psychological Association, 1983, 20, 183-193.(a)
- Svebak, S. The effect of information load, emotional load, and motivational state upon tonic physiological activation. In H. Ursin and R. Murison (Eds.), Psychological basis for psychosomatic disease. New York: Pergamon Press, 1983.(b)
- Svebak, S., Dalen, K., and Storffjell, O. The psychological significance of task-induced tonic changes in somatic and autonomic activity. Psychophysiology, 1981, 18, 403-409.

Svebak, S., Storfjell, O., and Dalen, K. The effect of a threatening context upon motivation and task-induced physiological changes. British Journal of Psychology, 1982, 73, 505-512.

Walters, J., Apter, M. J., and Svebak, S. Colour preference, arousal, and the theory of psychological reversals. Motivation and Emotion, 1982, 6, 193-215.

Figure Legend

Fig. 1. Changes in passive forearm flexor EMG activity, skin conductance level, and thorax respiratory cycle amplitudes during the performance of a continuous perceptual-motor task lasting for 150 seconds (with scoring periods at the end of successive 30 second blocks). Pre- and post-baseline values are included.



▲ = telic dominant group
 △ = paratelic dominant group

The Development of the Telic Dominance Scale

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Summary: The development of a 42-item measure of a number of personality features derived from the theory of psychological reversals is reported. These personality features are (a) the extent to which a person is serious-minded, (b) the extent to which a person plans ahead and organizes himself in the pursuit of goals, and (c) the extent to which a person seeks to avoid arousal. These features together are seen to constitute a personality trait which is described as *telic dominance*. Data concerning the test-retest reliability, criterion-related and construct validity of the Telic Dominance Scale are presented, together with the scale and scoring key.

This paper reports on the development of a scale intended to measure a personality dimension derived from a new theory in psychology known as the theory of psychological reversals (Smith & Apter, 1975). This theory argues that although many psychological systems are homeostatic and involve one stable state for the organism, other psychological systems are bistable and involve the organism having two preferred stable states. Often the two members of a pair of such bistable states can be seen as opposite to each other; when a switch occurs from one stable state to the other opposing state a *reversal* may be said to have occurred.

For example, it is argued that there are two stable states in relation to felt arousal. In one of these the individual attempts to gain as much arousal as possible, high arousal being felt as pleasant ("excitement") and low arousal as unpleasant ("boredom"). In the opposite stable state the individual attempts to reduce arousal as far as possible; in this case high arousal is felt as unpleasant ("anxiety") and low arousal as pleasant ("relaxation"). In this context, it should be noted that it is the way in which arousal is interpreted affectively by the organism rather than the level of arousal which is seen to be bistable. Although these two states are each said to be stable, reversal from one state to the other may be induced by a variety of factors. This approach to arousal differs fundamentally from that of optimal

arousal theory which implies homeostasis. Some data in relation to felt arousal which is more consistent with the idea of bistability than of homeostasis has been presented by Apter (1976).

A number of pairs of opposites which act in a bistable fashion have been suggested within the theory, each pair being represented in consciousness by contrasting experiential states. The identification of these pairs has its origins in self-observation and clinical experience. One aspect of the development of the present scale is that it constitutes an attempt to demonstrate the existence of a dimension associated with one of the principle pairs of opposites in the theory.

According to the theory, a particular individual may be predisposed to spend more time in one state than the other for a given pair of opposite states. That is to say, other things being equal, he is more likely to be in one state rather than its opposite at any specified time. For that individual one member of the pair may be said to be *dominant* over the other, and this dominance can be regarded as a feature of his personality. This dominance can be thought of as a personality trait, although the notion of "trait" as applied here is a little unusual. This is because the feature denotes a probability of an individual being in a given state rather than its opposite; but he will be expected to change to the opposite state from time to time under certain conditions. In contrast, a trait like extraversion implies that the individual is extravert to a given extent *all the time*. Traits generally imply consistency; the personality features

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which are derived from the theory of reversals, although description of general trends, are based on processes which are inherently inconsistent.

The aim of the Telic Dominance Scale (TDS) is to measure the degree of dominance of the telic state over its opposite state, termed "paratelic" for individual respondents.

The telic state is defined as a state of mind in which the individual sees himself as pursuing some essential goal. Pleasure derives in this state from achievement of the goal or from the anticipation of such an achievement. In the paratelic state, in contrast, the individual either does not see himself as pursuing a goal at all, or if a goal is being pursued, this is not seen by him as being essential; rather, it is an excuse to perform the behavior. In this state of mind pleasure derives from the performance of the behavior itself and from related sensations and feelings. Furthermore, the telic state is one in which the individual's focus of attention tends to be on the future, whereas in the paratelic state of mind it tends to be focused upon immediate sensations — on the "here and now."

The previous distinction between arousal-avoidance and arousal-seeking is also supposed, in the theory, to be related to the telic-paratelic distinction. The telic state is said to be characterized by the attempt to lower arousal and thus avoid anxiety; in contrast, the paratelic state is characterized by the attempt to raise arousal and thus seek excitement.

Although it may appear that the personality features measured by the TDS bear relationship to certain features measured by other scales like the sensation-seeking scale (Zuckerman, 1971) and the impulsiveness scale (Eysenck & Eysenck, 1977) the rationale underlying the TDS is in fact quite different as is indicated above.

Scale Construction and Item Analysis

A 69-item inventory to measure telic dominance was constructed, the 69 items being selected from a pool of 90 potential items by a panel of five judges using face validity criteria. Each item required the respondent to choose between two alternatives which were seen to represent telic

and paratelic choices respectively. For respondents uncertain as to their choice, a "not sure" option was also available for each item. The instruction to respondents read:

If you have an open choice, which of the following alternatives would you usually prefer, or which most nearly applies to you.

The respondent was, therefore, required to make a general self-assessment rather than to judge his or her current state.

Each item included in the inventory had been allocated to one of three subscales by the judges who had selected the items from the original pool. The three subscales were:

Seriousmindedness — the degree to which an individual is oriented toward goals seen as essential or important to himself or herself (or others identified with), physically or psychologically, rather than goals seen as being trivial, arbitrary or inessential.

Planning Orientation — the degree to which an individual plans ahead and organizes in pursuit of goals, rather than taking things as they come. That is, it is the degree to which a person is oriented toward the future rather than the present and the extent to which pleasure is gained from the achievement of goals or in anticipating goal achievement rather than from immediate behavior or sensations.

Arousal Avoidance — the degree to which an individual avoids situations which generate high arousal and seeks situations in which arousal levels are low.

These three subscales all relate to the telic-paratelic dimension and the serious-mindedness subscale is seen to constitute the defining characteristics of this dimension. The subscales are not necessarily connected, i.e. one could be high on any one of these subscales and low on the other two; however, the theory of reversals suggests that there will in fact tend to be a close relationship between them. It should also be noted that we would expect the relationship between arousal avoidance and the other two subscales to be less strong than that obtaining between the serious-mindedness and planning orientation subscales. One reason for this assertion is that sometimes high arousal may be required temporarily in the telic

Table 1
Intercorrelations Between Subscales and Total Score for 69-Item Inventory
($n = 119$)

	Serious Mindedness	Planning Orientation	Arousal Avoidance	Total
Serious- Mindedness	—	—	—	—
Planning Orientation	.632	—	—	—
Arousal Avoidance	.351	.470	—	—
Total	.810	.870	.720	—

system in order to achieve subsequent low arousal.

Responses to the 69-item inventory were scored in a telic direction. A telic choice was scored as 1, paratelic choices were not scored and "not sure" responses were scored as .5. The scoring of "not sure" choices is an accepted practice in such inventories (see Eysenck & Wilson, 1975; Figart, 1965). Scores for each subscale are obtained and summed to give a total score which acts as an indicator of the telic dominance of each subject. The higher the score, the greater the telic dominance. (The scale could, of course, equally well have been scored in the opposite direction and called the "paratelic dominance scale").

The test was administered to an opportunity sample of 119 adults, varying widely in age and background, the largest group of which consisted of 38 full-time undergraduate students of psychology. The resulting data was subject to a thorough analysis, details of which are presented below.

The distribution of each of the subscales was normal. Despite a small negative skew and a relatively high degree of observed platykurtosis, the arousal avoidance subscale correlated significantly with the planning orientation and seriousmindedness subscales as well as with the total score. Table 1 gives this data. These correlations, which are all significant at the 1% level, support the predic-

tion from reversal theory that the three characteristics measured by these subscales would be related to each other. It will also be noted that, though significant at the 1% level, the correlation between arousal avoidance and seriousmindedness is weaker than that existing between the seriousmindedness and planning orientation subscales. Using the Fisher z transformation and the procedures given in Guildford and Frutcher (1973, pp. 166-167) for examining differences between correlation coefficients, the differences in z s deviate from 0.0 to the extent of -2.470 . This is a statistically significant difference ($p < .05$) indicating that though the arousal avoidance subscale is clearly associated with each of the other subscales of the TDS and also the total score, the level of association is significantly weaker than the level of association for seriousmindedness or planning orientation. This is not inconsistent with predictions from the theory mentioned above.

As a measure of item: subscale and item: scale consistency the alpha coefficient was used (Cronbach, 1951). Table 2 gives the alpha coefficients for each subscale and the total score, all of which show high consistency. Interestingly, the arousal avoidance subscale had, relatively, the highest degree of consistency, though differences between the alpha coefficients were slight.

Following from a comprehensive data

Table 2

Alpha Coefficients for Each Subscale and the Total Score
($n = 119$)

	Serious-Mindedness	Planning Orientation	Arousal Avoidance	Total
Alpha	.691	.655	.734	.837

Table 3

Means, Standard Deviations and Ranges for Subscales and Total Scores
for the 42-item TDS

	Mean	S. D.	Range
Seriousmindedness	6.4	1.9	1.5 to 10.0
Planning Orientation	5.6	2.1	0.0 to 11.0
Arousal Avoidance	6.4	2.3	1.0 to 11.0
Total Score	18.5	4.2	6.0 to 23.5

analysis items were excluded from this first version of the scale if they were seen to be ambiguous and vague or not to discriminate between telic and paratelic orientations. Operationally, an item was seen to be ambiguous if 10% or more of respondents used the "not sure" response or if, in comments made by respondents, ambiguity was indicated. An item was not seen to discriminate if 85% or more of the respondents chose either the telic or paratelic response. Using these criteria, 12 items were excluded.

Further items were excluded using an item: subscale and item: total score criterion. Items for which the biserial correlation coefficients between either item: own subscale or item: total score were less than .238 were excluded, this being the figure at which r s became significant at $p < .01$. Two items were excluded using this criterion.

Following the application of these three criteria (ambiguity, discrimination, and association) to exclude items left an uneven number of items in each of the subscales. It was decided that all subscales

should be 14 items, this being the size of the scale with the smallest number of items at the end of this analysis. There are several reasons for preferring subscales with an equal number of items. These include the fact that it will be convenient for future research to make the subscales comparable with each other without further computation and that the total score is not unduly weighted by any single subscale.

The resulting version of the scale consisted of 42 items divided into three subscales of 14 items each. This scale, which from now will be referred to as the Telic Dominance Scale (TDS), is given in Appendix A. Each item has been labelled with the subscale to which it belongs (S for seriousmindedness, P for planning orientation, and A for arousal avoidance) and the telic choice within each item has been marked with an asterisk. Table 3 gives the means, standard deviations and range of the scores obtained through the use of this 42-item scale with 112 first year, part-time undergraduates of the Open University aged between 21 and 60.

Table 4

Test-Retest Reliability Studies of the TDS for Differing Periods of Elapsed Time

Group	Time Between	<i>n</i>	Serious-Mindedness	Planning Orientation	Arousal Avoidance
1	6 hours	32	.952	.803	.872
2	6 weeks	48	.605	.773	.790
3	6 months	32	.634	.702	.711
4	12 months	15	.632	.677	.698

Reliability

Four reliability studies were carried out using the TDS with four different groups of adult subjects over differing periods of time. Group 1 consisted of 32 students of art and psychology, together with some staff colleagues; group 2 of students at a technical college aged between 17 and 35; group 3 of full-time undergraduate students of psychology and group 4 of housewives attending occasional talks and seminars on psychology as part of a recreational program.

The results are shown in the resulting Table 4. As can be seen from this data, these results are highly satisfactory, with all of the test-retest reliability coefficients being significant at $p < .01$ irrespective of the time interval. Without this evidence there would have been some reason to suspect that, despite the instruction to respondents to answer in terms of their *usual* preferences, they might well have been responding in terms of their *current* preferences. (In time of reversal theory these two may, of course, be very different). That is to say, the reliability data given in Table 4 helps to establish that the TDS is *not* a state measure and that the indications of telic dominance given by the scale scores may properly be regarded as enduring personality characteristics.

Validity

A number of validity studies have been conducted using the TDS. These studies are reported below.

Factor Analysis

Using principle component factor

analysis with varimax rotation a factor analysis was conducted on the scale responses of 100 part-time undergraduate adult students of the Open University aged between 21 and 60. A three factor model was seen to be the most satisfactory nontrivial factor solution, with the three rotated factors closely resembling the three factors selected on the basis of face validity criteria. Using the factors produced through the application of the principal components method, the serious-mindedness and planning orientation factors were seen to account for 79% of the variance in the test scores. No significant effects due to age or sex were observed when a multiple analysis of variance was conducted.

Global Self-descriptions

The "Who Am I" (WAI) test is a self-descriptive, unstructured device for discovering the way in which subjects choose to describe themselves (Kuhn & McPartland, 1954). The WAI was administered to 51 undergraduate students of psychology at the University College, Cardiff. Global ratings of student responses were given by three judges independently of each other, using a 5-point scale in which high scores indicated high telic dominance. The mean of the interjudge reliability coefficients was .879 ($p < .05$). The sum of these ratings across all three judges was correlated with the total score of each respondent on the TDS. This gave a correlation of .30 ($p < .05$). This indicated that TDS scores are consistent with certain aspects of the way in which subjects perceive themselves.

Table 5

Correlations Between Robinson's *n* Ach Measure and the TDS
(*n* = 112)

	Serious-Mindedness	Planning Orientation	Arousal Avoidance
Hope of Success	-.275	-.288	-.272
Fear of Failure	.263	.277	.271

State Measures in Everyday Life

During the course of a week, 14 subjects rated themselves at hourly intervals each afternoon, in terms of two 7-point scales which relate to the telic-paratelic dimension. Latitude was given about how long into the evening the subjects would rate themselves, but it was emphasized that the scales should be rated irrespective of the ongoing activity at the time. The median number of ratings per subject was 30.

On one scale the subjects rated how far at that moment they were inclined to do something serious or something playful. On the other they rated the extent to which they were seeking excitement or relaxation. The average for each subject on each of these rating scales was calculated and ranked and the results for the first scale (serious/playful) were correlated with their ranked scores on the serious-mindedness subscale of the TDS; scores on the second rating scale (excitement/relaxation) were correlated with their ranked scores on the arousal avoidance subscale of the TDS. The aim of this was to see whether the preferences expressed in the TDS represented real preferences in everyday life. The rank correlation in the first case was .345, which just misses significance at the 5% level; the second rank order correlation was .662 which is significant ($p < .01$). Both of these correlations were in the anticipated direction.

Construct Validity Studies

In the first of a number of construct validity studies, 112 first year undergraduate students of the Open University aged between 21 and 60 completed

the 15-item *Q* Ach need for achievement scale of Robinson (1961) and the TDS. The *Q* Ach scale, previously used by Argyle and Robinson (1967), provides two *n* Ach measures which relate directly to the personality features measured by the TDS. These are: (a) a measure of "hope of success," (b) a measure of "fear of failure." Table 5 provides the correlation matrix for these two *n* Ach measures against the three subscales of the TDS. All correlations are significant at the 1% level. The data presented in Table 5 indicate that persons who may be regarded as highly telic appear to fear failure while persons who may be regarded as having a low degree of telic dominance (i.e. are highly paratelic) have a high hope of success, as indicated by the negative correlations.

From the description of telic dominance provided at the outset, it is clear that the highly telic dominant individual should be more prone to feelings of anxiety than the individual who has a low telic dominance score. In the second construct validity study, the TDS was administered to 60 full-time undergraduate students together with two measures of anxiety. One of these anxiety measures was the trait measure of Spielberger, Gorsuch, and Lushene (1970), while the other was the anxiety-defensiveness measure of Millimet (1970). The latter measure is said to relate to "a dimension of personality reflecting low anxiety and effective avoidance of defenses against anxiety at one pole and high anxiety and ineffective avoidance defenses against anxiety at the other pole" (p. 610). The correlations between both of these anxiety measures and the TDS total score were positive ($r = .19$

Table 6

Intercorrelations Between the TDS and the Shortened Version of the EPI
($n = 112$)

	Extraversion	Neuroticism
Seriousmindedness	.061	.070
Planning Orientation	.077	.044
Arousal Avoidance	.049	-.045

and = .24 respectively); the correlation between the TDS and the Millimet measure was significant ($p < .05$). This relationship suggests that telic dominance is associated with higher levels of anxiety expressed in terms of weak anxiety defense.

In a further construct validity study, 60 undergraduate students of psychology completed a variation of Stroop's color-word interference task (Stroop, 1935) in which subjects are asked to note the color of words which are presented, some of the words being unpleasant and emotive (like slime, stench, cancer) and others neutral. Ostensibly the task is about color-naming, but subsequently subjects are asked to recall as many words as they can from the word lists. If subjects remember more words in the first than the second group, it implies some form of sensitization to unpleasant and emotive words; if subjects remember fewer words in the first than the second group it implies that some form of defense has taken place in relation to these words.

In the present study 10 words were used in each group and presented on cards in various combinations, each word appearing 12 times in all. The results showed a negative product-moment correlation between the number of unpleasant words remembered and telic dominance scores ($r = -.32, p < .05$); that is, the more paratelic the subject the more unpleasant words recalled. In terms of the discrepancy between the number of emotional words recalled and the number of neutral words recalled, there was again a negative product-moment correlation with telic dominance scores ($r = -.37, p < .05$).

Since the discrepancy of all subjects was in the direction of more unpleasant than neutral words being recalled, the effect in this experiment was one of sensitization rather than defense; presumably the unpleasant words were not sufficiently threatening to produce defense. Subjects scoring low telic dominance were significantly more sensitized to the words than subjects scoring high on the TDS scale. This is consistent with reversal theory since paratelic dominant subjects would be expected to be more sensitized to words which produce arousal than would telic dominance subjects. The same pattern of results emerged when subjects were asked to pick out words presented in the task from a list of unfamiliar words, i.e. when subjects were tested in terms of recognition rather than recall. The product-moment correlation between the number of unpleasant words recognized the TDS scores was $-.24 (p < .05)$, and the product-moment correlation between TDS scores and the discrepancy between unpleasant and neutral words was $-.27 (p < .05)$. The results of this particular validation study are particularly interesting since the comparison of the TDS here is with actual behavioral measures rather than with further psychological tests.

In the final validity study, 112 first year part-time undergraduate students of the Open University completed the short, 12-item version of Eysenck's extraversion/neuroticism measure (Eysenck, 1958) together with the TDS. The purpose of this study was to demonstrate that the TDS did not measure extraversion or neuroticism. Table 6 provides the

interscale correlations and these correlations all fail to reach significance, which demonstrates that the TDS does *not* measure either extraversion or neuroticism.

Conclusion

The data presented in this paper are generally consistent with the idea of a personality characteristic which can be referred to as "telic dominance" and which can be measured with the TDS, details of which have been given.

It is felt that the Telic Dominance Scale will have a number of applications in clinical, educational, and occupational psychology. Later publications will explore some of these applications. Meanwhile, it should be noted that the theory of reversals, from which the notion of telic dominance derives has been applied to the elucidation of certain clinical and counseling problems (Apter & Smith, 1976a, 1976b) and also to the explanation of religious behavior (Apter & Smith, 1977a) and humor (Apter & Smith, 1977b).

Reference Note

1. Apter, M. J., & Smith, K. C. P. *Religion and the theory of psychological reversals*. Paper presented at the second Lancaster Colloquium on the psychology of religion, Oxford, 1977.

References

- Apter, M. J. Some data inconsistent with the optimal arousal theory of motivation. *Perceptual and Motor Skills*, 1976, 43, 1209-1210.
- Apter, M. J., & Smith, K. C. P. Psychological Reversals: Some new perspectives on the family and family communication. *Proceedings First International Family Encounter*, Mexico, 1976 (November, a).
- Apter, M. J., & Smith, K. C. P. Negativism in adolescence. *The Counsellor*, 1976, 23/24, 25-30. (b)
- Apter, M. J., & Smith, K. C. P. Humor and the theory of psychological reversals. In A. Chapman and H. Foot (Eds.), *It's a funny thing humor: Proceedings of the international conference on humor and laughter*, Cardiff. Oxford: Pergamon Press, 1977.
- Argyle, M., & Robinson, P. Two origins of achievement motivation. *British Journal of Social and Clinical Psychology*, 1962, 1(2), 107-120.
- Cronbach, L. T. Coefficient alpha and the internal structure of tests. *Psychometrika*, 1951, 16, 297-334.
- Eysenck, H. J. Short questionnaire for the measurement of two dimensions of personality. *Journal of Applied Psychology*, 1958, 42, 14-17.
- Eysenck, H. J., & Wilson, G. *Know your own personality*. London: Temple-Smith, 1975.
- Eysenck, S. B. G., & Eysenck, H. J. The place of impulsiveness in a dimensional system of personality description. *British Journal of Social and Clinical Psychology*, 1977, 16, 57-58.
- Figart, R. L. *An elementary school form of the dogmatism scale*. Unpublished doctoral dissertation, Ball State University, 1965.
- Guildford, J. P., & Frutcher, B. *Fundamental statistics in psychology and education*, (5th ed.) Tokyo: McGraw Hill, 1973.
- Kuhn, M. H., & McPortland, T. S. An empirical investigation of self-attitudes. *American Sociological Review*, 1954, 19, 68-76.
- Millimet, C. R. Manifest anxiety-defensiveness scale: First factor of the MMPI revisited. *Psychological Reports*, 1970, 27, 603-616.
- Robinson, P. *The measurement of achievement motivation*. Unpublished doctoral dissertation, University of Oxford, 1961. Scale reproduced in Cohen, L. *Educational Research in classrooms and schools: a manual of methods and materials*. London: Harper & Row, 1976.
- Smith, K. C. P., & Apter, M. J. *A theory of psychological reversals*. Chippenham, U. K.: Picton Press, 1975.
- Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. *Manual for the trait-state anxiety inventory*. Palo Alto, Calif.: Consulting Psychologists Press, 1970.
- Stroop, J. R. Studies of interference in serial verbal reactions. *Journal of Experimental Psychology*, 1935, 18, 643-662.
- Zuckerman, M. Dimensions of sensation seeking. *Journal of Consulting and Clinical Psychology*, 1971, 36, 45-52.

Appendix A¹

Note: (S) = seriousmindedness; (P) = planning orientation; (A) = arousal avoidance; an asterisk (*) denotes the telic choice in each item.

- | | |
|--|--|
| 1 (P) Compile a short dictionary for financial reward* | 2 (P) Going to evening class to improve your qualifications* |
| Write a short story for fun | Going to evening class for fun |
| Not sure | Not sure |

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Appendix A (cont'd)

- | | |
|---|--|
| 3 (A) Leisure activities which are just exciting
Leisure activities which have a purpose*
Not sure | 14 (S) Leisure activities
Work activities*
Not sure |
| 4 (P) Improving a sporting skill by playing a game
Improving it through systematic practice*
Not sure | 15 (A) Taking holidays in many different places
Taking holidays always in the same place*
Not sure |
| 5 (A) Spending one's life in many different places
Spending most of one's life in one place*
Not sure | 16 (S) Going away on holiday for two weeks
Given two weeks of free time finishing a needed improvement at home*
Not sure |
| 6 (P) Work that earns promotion*
Work that you enjoy doing
Not sure | 17 (S) Taking life seriously*
Treating life light-heartedly
Not sure |
| 7 (P) Planning your leisure*
Doing things on the spur of the moment
Not sure | 18 (A) Frequently trying strange foods
Always eating familiar foods*
Not sure |
| 8 (P) Going to formal evening meetings*
Watching television for entertainment
Not sure | 19 (A) Recounting an incident accurately*
Exaggerating for effect
Not sure |
| 9 (A) Having your tasks set for you*
Choosing your own activities
Not sure | 20 (P) Spending £100 having an enjoyable weekend
Spending £100 on repaying a loan*
Not sure |
| 10 (P) Investing money in a long term insurance/pension scheme*
Buying an expensive car
Not sure | 21 (A) Having continuity in the place where you live*
Having frequent moves of house
Not sure |
| 11 (A) Staying in one job*
Having many changes of job
Not sure | 22 (S) Going to an art gallery to enjoy the exhibits
To learn about the exhibits*
Not sure |
| 12 (A) Seldom doing things "for kicks"*
Often doing things "for kicks"
Not sure | 23 (S) Watching a game
Refereeing a game*
Not sure |
| 13 (S) Going to a party
Going to a meeting*
Not sure | 24 (S) Eating special things because you enjoy them |

Appendix A (cont'd)

- | | | |
|---|--------|---|
| Eating special things because they are good for your health* | 34 (A) | Winning a game easily* |
| Not sure | | Playing a game with scores very close |
| 25 (P) Fixing long-term life ambitions* | | Not sure |
| Living life as it comes | 35 (A) | Steady routine in life* |
| Not sure | | Continual unexpectedness or surprise |
| 26 (P) Always trying to finish your work before you enjoy yourself* | | Not sure |
| Frequently going out for enjoyment before all your work is finished | 36 (A) | Working in the garden* |
| Not sure | | Picking wild fruit |
| | | Not sure |
| 27 (P) Not needing to explain your behaviour | 37 (S) | Reading for information* |
| Having purposes for your behaviour* | | Reading for fun |
| Not sure | | Not sure |
| | 38 (S) | Arguing for fun |
| | | Arguing with others seriously to change their opinions* |
| 28 (S) Climbing a mountain to try to save someone* | | Not sure |
| Climbing a mountain for pleasure | 39 (S) | Winning a game* |
| Not sure | | Playing a game for fun |
| | | Not sure |
| 29 (S) Happy to waste time | 40 (A) | Traveling a great deal in one's job |
| Always having to be busy* | | Working in one's office or workshop* |
| Not sure | | Not sure |
| 30 (A) Taking risks | 41 (P) | Planning ahead* |
| Going through life safely* | | Taking each day as it comes |
| Not sure | | Not sure |
| 31 (S) Watching a crucial match between two ordinary sides* | 42 (P) | Planning a holiday* |
| Watching an exhibition game with star performers | | Being on holiday |
| Not sure | | Not sure |
| 32 (P) Playing a game | | |
| Organising a game* | | |
| Not sure | | |
| 33 (S) Glancing at pictures in a book | | |
| Reading a biography* | | |
| Not sure | | |

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